Appeal No. 2017-1250

IN THE
UNITED STATES COURT OF APPEALS
FOR THE FEDERAL CIRCUIT

OPENTV, INC.,

Appellant,

v.

MICHELLE K. LEE, DIRECTOR, U.S.
PATENT AND TRADEMARK OFFICE,

Intervenor.

Appeal from the United States Patent and Trademark Office,
Patent Trial and Appeal Board,
in No. IPR2015-01031

OPENING BRIEF OF APPELLANT OPENTV, INC.

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CERTIFICATE OF INTEREST

Counsel for Appellant OpenTV, Inc., certifies the following (use "None" if applicable; use extra sheets if necessary):

1. The full name of every party represented by me is:

   OpenTV, Inc.

2. Name of the real party in interest (please only include any real party in interest NOT identified in Question 3) represented by me is:

   None.

3. Parent corporations and publicly held companies that own 10% or more of the stock of the party:

   OpenTV is a wholly owned subsidiary of Nagra USA, Inc., which is a wholly owned subsidiary of Kudelski S.A. All are real parties in interest.

4. The names of all law firms and the partners or associates that appeared for the party or amicus now represented by me in the trial court or agency or are expected to appear in this court (and who have not or will not enter an appearance in this case) are:

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STATEMENT OF RELATED CASES

No other appeal from this *inter partes* review of U.S. Patent No. 7,900,229 (“the ’229 patent”) was previously before this or any other appellate court.

I. STATEMENT OF JURISDICTION

This appeal arises from the September 26, 2016, Final Written Decision of the Patent Trial and Appeal Board ("Board") pursuant to 35 U.S.C. § 318 and 37 C.F.R. § 42.73 in *inter partes* review ("IPR") No. IPR2015-01031. Appx1-26. OpenTV, Inc. ("OpenTV"), filed its notice of appeal on November 21, 2016, within the time required by 37 C.F.R. § 90.3(a)(1). This court has exclusive jurisdiction over OpenTV's appeal of the Board's Final Written Decision in this IPR under 28 U.S.C. § 1295(a)(4)(A) and 35 U.S.C. § 319.

II. STATEMENT OF THE CASE

Patent Owner OpenTV appeals the final determination of the Board holding claims 14-16, 19, 21, 26, 28, and 30 of U.S. Patent No. 7,900,229 ("the '229 patent") unpatentable. *See* Appx1-26. The '229 patent discloses and claims an interactive television system connecting user activities related to television viewing with user activities unrelated to television viewing. *See infra* § IV.A. In particular, the '229 patent claims a common user profile for both television-related and unrelated activities, and a system configured such that user activities on one device affect content provided in response to user activities on a different device. *See id.* For example, the '229 patent explains that "a user's cell phone activity may affect the information the user receives at home on their television, and vice versa." Appx37, 2:6-10; *see also infra* § IV.A.

In the Final Written Decision, the Board ruled that Apple Inc. ("Apple") proved that the '229 patent claims are anticipated by European Patent Application publication EP 1 100 268 A2 ("*Tomioka*") (Appx2480-2553). Apple's challenge began with a Petition listing numerous string citations and quotations from *Tomioka* for each claim element without explaining how to map the reference to the claimed configuration. *See infra* § IV.C. Apple revised and supplemented its challenge in the Petitioner's Reply, adding new mappings and refining its prior mappings for every element of the claimed system configuration. *See infra* §§ IV.D, IV.F. In the words of the Board, Apple "started out in the Petition citing gobs and gobs of material for each particular claim element, and then you took the Reply as an opportunity to narrow that to be much more precise." Appx1053-1054; *see also infra* § IV.D. Nonetheless, the Board permitted Apple's shifting theories, even relying on new evidence from the Reply—including paragraph [0104] of *Tomioka*—to support its Final Written Decision. *See infra* §§ IV.D, IV.E, IV.F. This violates 35 U.S.C. § 312 because, "[u]nlike district court litigation—where parties have greater freedom to revise and develop their arguments over time and in response to newly discovered material—the expedited nature of IPRs bring[s] with it an obligation for petitioners to make their case in their petition to institute." *Intelligent Bio-Sys., Inc. v. Illumina Cambridge Ltd.*, 821 F.3d 1359, 1369 (Fed. Cir. 2016).

The Board likewise shifted its own positions and filled in arguments on Apple's behalf. When instituting review, the Board supported its anticipation grounds based on mapping paragraph [0062] of *Tomioka* to an element that Apple did not map paragraph [0062] to in the Petition. *See infra* §§ IV.C, IV.F. And in its Final Written Decision, the Board used new evidence—paragraph 72 of Apple's expert declaration—to show that a claim element would be "necessarily" present in *Tomioka*, even though Apple did not argue inherency in its anticipation challenge. *See infra* § IV.E. This was error because, "while the [U.S. Patent and Trademark Office ('PTO')] has broad authority to establish procedures for revising earlier-granted patents in IPRs, that authority is not so broad that it allows the PTO to raise, address, and decide unpatentability theories never presented by the petitioner and not supported by record evidence." *In re Magnum Oil Tools Int'l, Ltd.*, 829 F.3d 1364, 1381 (Fed. Cir. 2016).

The Board rebuffed OpenTV's repeated protests that Apple's lack of particularity violated the IPR statute, obscured how *Tomioka* would be mapped to the claims, and limited OpenTV's ability to form a complete reply. *See infra* §§ IV.C, IV.E. In its Final Written Decision, the Board responded to some, but not all, of OpenTV's arguments and left several of its conclusions unexplained. *See infra* § IV.E. The Board also supported a number of its rulings by citing seemingly unrelated parts of the record. *See infra* § IV.E. Coupled with Apple's inadequate

Petition and evolving theories, the Final Written Decision has left OpenTV uncertain about why its claims have been ruled unpatentable, in violation of case law requiring the Board to articulate the reasons for its actions.

Finally, the Board supported its anticipation ruling by quoting *Kennametal, Inc. v. Ingersoll Cutting Tool Co.*, 780 F.3d 1376, 1381 (Fed. Cir. 2015), for the proposition that "a reference can anticipate a claim even if it 'd[oes] not expressly spell out' all the limitations arranged or combined as in the claim, if a person of skill in the art, reading the reference, would 'at once envisage' the claimed arrangement or combination." *See infra* § IV.E. This Court has since clarified, however, that while *Kennametal* might permit anticipation where a reference discloses a limited number of possible combinations, it "does not stand for the proposition that a reference missing a limitation can anticipate a claim if a skilled artisan viewing the reference would 'at once envisage' the missing limitation." *Nidec Motor Corp. v. Zhongshan Broad Ocean Motor Co.*, No. 2016-1900, slip op. at 7 (Fed. Cir. Mar. 14, 2017). Because the Board here relied on what one would "envisage" to provide the missing claim limitation linking two different types of user activity, the Final Written Decision falls short of proving anticipation under 35 U.S.C. § 102, which, "with its strict identity requirement, [is] quite rare." *Trintec Indus., Inc. v. Top-U.S.A. Corp.*, 295 F.3d 1292, 1297 (Fed. Cir. 2002).

III. STATEMENT OF ISSUES

1) Whether the Board violated the IPR statute and the Administrative Procedure Act ("APA") by:

   a. permitting the Petitioner to revise and supplement its arguments after Patent Owner filed its response, and relying upon Petitioner's improper new arguments in the Final Written Decision;

   b. changing positions from the Institution Decision to the Final Written Decision by adopting an argument and evidence that were not advanced by the parties for the instituted grounds; and

   c. providing a Final Written Decision that is (i) unclear regarding which legal theory the Board relies upon or why it favored Petitioner's arguments over Patent Owner's; (ii) missing responses to most of Patent Owner's arguments; and (iii) inaccurate in multiple instances.

2) Whether the Board erred in finding the claims—which require a specific relationship between a user activity related to television and a user activity unrelated to television—anticipated by *Tomioka* based only on what a person of ordinary skill would "at once envisage," despite controlling law that "does not permit the Board to fill in missing limitations simply because a skilled artisan would immediately envision them" in the context of anticipation? *Nidec*, slip op. at 7.

IV. STATEMENT OF FACTS

A. U.S. Patent No. 7,900,229

The patented invention improves interactive television for a user who conducts both activities on a television and activities unrelated to television, such as web browsing or making a phone call from a particular location. Appx37, 1:52-56; Appx39, 6:49-54; Appx40, 7:18-33. Combining other technologies with television provides more personalized services and content to individual users. Appx37, 1:8-11, 1:43-56.

In particular, the ’229 patent claims a common user profile for both television-related and unrelated activities. Appx43, 14:33-59. In the patented system, user activities on one device affect content provided in response to user activities on a different device, via the common user profile. *Id*. For example, “a user’s cell phone activity may affect the information the user receives at home on their television, and vice versa.” Appx37, 2:6-10; *see also* Appx4. Claim 14 is representative of the claims on appeal and recites the ’229 patent’s specific system configuration to provide the desired linking of different user activities (emphases on relevant claim language):

> 14. An interactive television system comprising:
>
> a remote unit;
>
> a set-top box; and

> a broadcast station coupled to convey a programming signal to the set-top box;
>
> wherein the system is configured to:
>
> > ***update a user profile responsive to a first user activity, the first user activity being initiated via a first device*** corresponding to one of the remote unit and the set-top box;
> >
> > ***detect a second user activity, the second user activity being initiated via a second device*** corresponding to one of the remote unit and the set-top box, the second device being ***different from the first device, wherein either***
> >
> > > ***(i) the first user activity comprises an activity related to television viewing and the second user activity comprises an activity unrelated to television viewing, or***
> > >
> > > ***(ii) the first user activity comprises an activity unrelated to television viewing and the second user activity comprises an activity related to television viewing;***
> >
> > access the user profile in response to the second user activity; and
> >
> > ***transmit data responsive to the second user activity***, wherein the transmitted data is based at least in part on the user profile, and ***wherein the first user activity affects a content of said data transmitted to the user responsive to the second user activity.***

Appx43, 14:33-59.

During prosecution, the claimed system was found patentable over the prior art because it claims a common user profile for activities that are both television-related and unrelated to television viewing, and because the prior art "lack[ed] a description of any interaction between the first user activity and the second user activity." Appx2233; Appx2138-2139.

B. The Prior Art (EP 1 100 268 A2 to *Tomioka*)

The instituted prior art, European Patent Application publication EP 1 100 268 A2 to *Tomioka*, describes a problem with the state of the art. *Tomioka* describes an environment in which households have many devices, such as multiple television sets, multiple VCRs, a home stereo, a car stereo, etc. Appx2482, ¶ [0037]; Appx2018. Each device can have a different interface to obtain, select, record, and play content. Appx2482, ¶ [0037]. "For example, a VCR permits the selection of the recording times but the user has to correlate the television guide with the desired recording times." *Id.* "Another example is the user selecting a preferred set of preselected radio stations for his home stereo and also presumably selecting the same set of preselected stations for each of the user's vehicles." *Id.* Prior to *Tomioka*'s system, this required that the user program each device or reprogram devices with multiple users. *Id.* When the user is traveling, the user may also encounter devices with an unfamiliar interface. Appx2482, ¶ [0038]; Appx2018.

To solve the problem faced by a user changing between devices (e.g., from a home stereo to car stereo), *Tomioka* discloses a "user description scheme [that] is modular and portable so that users can carry or port it from one device to another . . . .” Appx2484, ¶ [0046]; Appx14. *Tomioka* also discloses that, “[w]hen [a] user description scheme is standardized among different manufacturers or products, user preferences become portable.” Appx2484, ¶ [0046]. Accordingly, users can easily program a television in a hotel room using their home television settings. *Id.* Because the user description scheme of *Tomioka* is modular, it can maintain different preference and history descriptions (e.g., one scheme for televisions, one scheme for radios) in a user preference description. Appx2514, ¶ 93; Appx18-19; *see also* Appx2147. *Tomioka* also discloses that the user description data may be used to “provid[e] targeted advertising or programming on the device based on such data.” Appx2514, ¶ [0093]. For example, *Tomioka* discloses performing television activities automatically based on prior television activities:

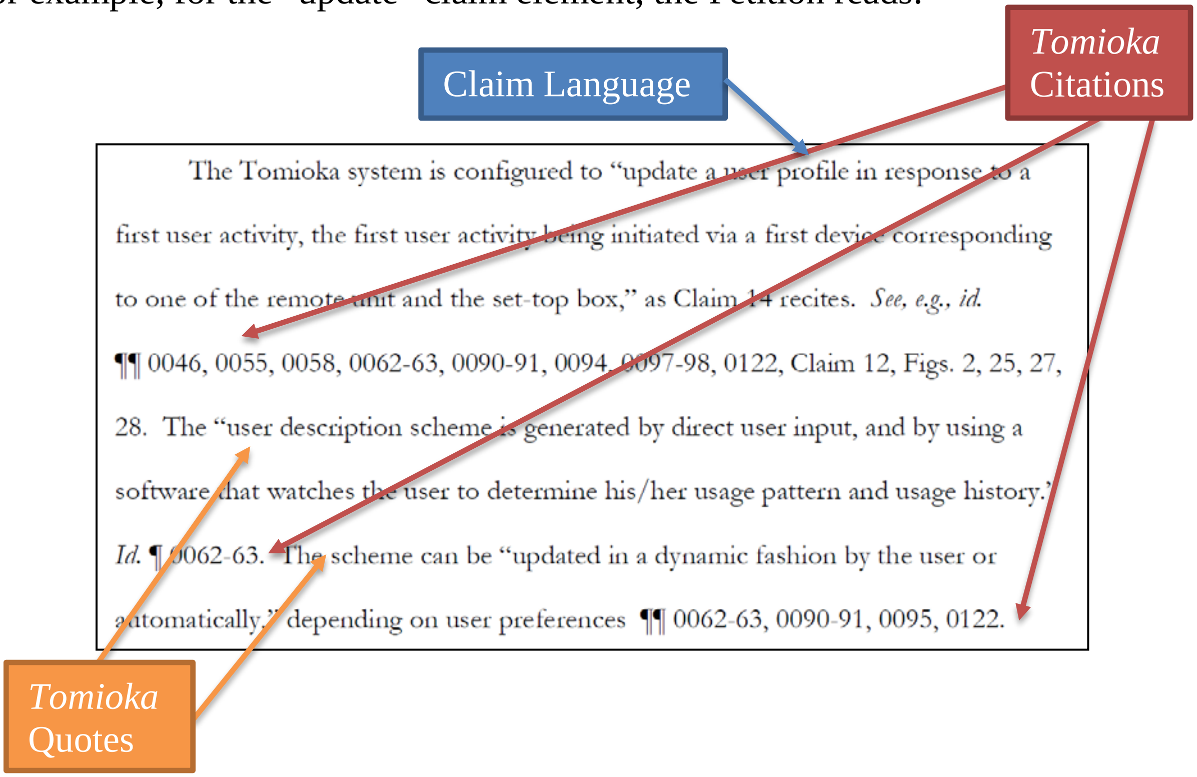
> An advanced VCR system can learn from the user via direct input of preferences, or by watching the usage pattern and history of the user. The user description scheme holds user’s preferences . . . and usage history. An intelligent agent can then consult with the user description scheme . . . for acting on behalf of the user. . . . [T]he system acts on behalf of the user to discover programs that fit the taste of the user, alert the user about such programs, and/or record them autonomously.

Appx2487, ¶ [0063]; Appx19. *Tomioka* expressly recognizes, however, that in situations where the device types are different, the user must “maintain multiple separate user preference descriptions.” *See* Appx2516-2517, ¶¶ [0106], [0110]; Appx2147.

C. The IPR Pre-Institution Phase

Apple filed a Petition proposing institution of IPR of claims 14-16, 19, 21, 24, 26, 28, 30, and 31 of the ’229 patent. Appx2007-2008. The Petition alleged that these claims are both anticipated and obvious over *Tomioka*. Appx2007; Appx2016-2038 (for anticipation ground); Appx2038-2039 (for obviousness ground).

For each claim element of the system configuration in independent claim 14, the Petition included one paragraph quoting the ’229 patent claim language with a list of paragraphs, figures, and/or claims in *Tomioka*. *See, e.g.*, Appx2018-2020. For example, for the “update” claim element, the Petition reads:



The Tomioka system is configured to “update a user profile in response to a first user activity, the first user activity being initiated via a first device corresponding to one of the remote unit and the set-top box,” as Claim 14 recites. *See, e.g., id.* ¶¶ 0046, 0055, 0058, 0062-63, 0090-91, 0094, 0097-98, 0122, Claim 12, Figs. 2, 25, 27, 28. The “user description scheme is generated by direct user input, and by using a software that watches the user to determine his/her usage pattern and usage history.” *Id.* ¶ 0062-63. The scheme can be “updated in a dynamic fashion by the user or automatically,” depending on user preferences ¶¶ 0062-63, 0090-91, 0095, 0122.

Appx2018 (annotated). For the system configuration claim elements, Apple's Petition did not include any explanation mapping *Tomioka* to the claims beyond repeating the claim language and summarizing *Tomioka*.[1] *Id.* The accompanying claim chart likewise repeated the '229 patent claim language with quotes from *Tomioka* and citations to other paragraphs, figures, or claims, without any added explanation. Appx2023-2033. The citations in the prose and the claim chart overlapped in some instances, but not all. In total, for claim 14, Apple's Petition pointed to forty-three paragraphs, six figures, and one claim of *Tomioka* to support its proposed 35 U.S.C. § 102 ground.

The Petition was accompanied by an expert declaration (Ex. 1016) that included one section addressing purported anticipation and obviousness over *Tomioka*. Appx2871-2880. For the *Tomioka* anticipation grounds, the Petition cited the declaration for three things:

1. The premise that set-top boxes were known, and known to include storage. Appx2017 (citing Appx2872-2873, ¶ [0067]).

[1] The Petition also includes a discussion of what a person of ordinary skill would have known about the XML and MPEG standards, Appx2021-2022, but the Board did not rely upon the XML or MPEG standards in the Institution Decision or the Final Written Decision.

2. Background on the MPEG and XML standards. Appx2021-2022 (citing Appx2488-2489, ¶¶ 70-71, 74-77; Appx2518, ¶ 119).
3. The assertion that "one of ordinary skill would understand that Tomioka's system employs a user profile that combines activities across applications including television and web browsing and provides for searching and filtering of content across those activities." Appx2022 (citing Appx2878-2879, ¶ 76).

Although Apple's Petition cited the declaration for just these three things for the *Tomioka* anticipation grounds, the Board's Final Written Decision relied on another part of the declaration to support its theory of unpatentability. Specifically, though Apple did not argue inherency in its Petition, in the Final Written Decision, the Board relied upon an inherency position in a section used to support Apple's obviousness grounds—"it is necessarily the case that the Tomioka system is configured to 'detect a second user activity performed using a second device' and 'access the user profile in response to a second user activity.'" Appx2876, ¶ 72; Appx2038-2039; Appx17.

In its Preliminary Response, OpenTV argued against institution because the Petition did not satisfy the statute and regulations:

> Consistent with 35 U.S.C. § 312, which requires that "the petition identif[y], in writing and with particularity, each claim challenged, the grounds on which the challenge to each claim is based, and the evidence that supports the

> grounds for the challenge to each claim," Rule 42.22(a)(2) requires that the petition set forth "[a] full statement of the reasons for the relief requested, including a detailed explanation of the significance of the evidence including material facts, and the governing law, rules, and precedent."

Appx2080 (alterations in original). OpenTV explained that, "[i]n this case, the incompleteness of the petition's grounds renders them uninstitutable and leaves the patent owner without the ability to fully respond." *Id*. In particular, the Preliminary Response explained that "the petition maps more than 30 paragraphs of the Tomioka reference, spanning multiple, alternative embodiments, as being relevant to this claim feature without explanation of how those features allegedly disclose the claimed interaction." Appx2082 (citing Appx2027-2033). OpenTV also argued that providing unexplained string citations "places a significant burden on the Board and the patent owner to discern what the petitioner's intended argument is, frustrating the congressional intent for proceedings that provide a 'just, speedy, and inexpensive resolution.'" *Id.* (quoting *Liberty Mut. Ins. Co. v. Progressive Cas. Ins. Co.*, CBM2012-00003, Paper 7 at 2-3 (PTAB Oct. 25, 2012)). This is because the "incompleteness and omission of explanation unfairly limit[ ] the patent owner's ability to form a complete reply." Appx2082.

Despite OpenTV's concerns that it could not discern from the Petition how Apple proposed to map *Tomioka* to the claims, Appx2082, the Board instituted the anticipation grounds. The Board summarized the Petition as "provid[ing] a claim chart mapping the disclosure of Tomioka on challenged claims 14-16, 19, 21, and 24 of the ’229 patent,” citing thirteen pages of the Petitition. Appx2104. And the Board summarized two of OpenTV’s arguments as follows:

> Patent Owner contends that Petitioner’s anticipation arguments are deficient for two reasons. First, Patent Owner contends that Petitioner fails to address the claimed interaction between the first user activity and the second user activity with particularity. Second, Patent Owner contends that, because Petitioner’s mapping of Tomioka onto the challenged claims “relies on multiple, distinct teachings (e.g., different embodiments) of the reference, it fails to anticipate the claims as a matter of law.”

Appx2105 (citations omitted). The Decision did not, however, mention or address OpenTV’s third important argument—that OpenTV could not understand Apple’s argument from the Petition, so it could not fully respond. *See* Appx2104-2107; Appx2082. Instead, the Board responded to the first two contentions.

For the first contention, the Board pointed to paragraphs [0040], [0046], [0055], [0058], [0060], [0063], and [0069] of *Tomioka* cited in the Petition and *sua sponte* added a newly cited paragraph [0062]. Appx2105-2106. In particular, the Board noted Apple’s argument “that the system ‘*records and presents* to the user audio and video information *based upon* the user’s prior viewing and listening habits, preferences, and personal characteristics’” to disclose the claimed *transmitting*. Appx2105 (quoting Appx2019-2020).

For the second contention, the Board acknowledged that "Petitioner relies on disclosure in paragraphs spanning Tomioka's specification," Appx2106 (citing Appx2023-2036), and that *Tomioka* refers to "alternative" and "exemplary" embodiments, *id.*; *see also* Appx2481-2482, ¶¶ [0020]-[0034]. Nonetheless, the Board found that the cited parts of *Tomioka* relate to "variations" of the primary embodiment rather than alternatives. Appx2106-2107. The Board supported its conclusion that a "majority" of Petitioner's citations relate to a "common embodiment" in the reference by quoting *Kennametal*, 780 F.3d at 1381: "[A] reference can anticipate a claim even if it 'd[oes] not expressly spell out' all the limitations arranged or combined as in the claim, if a person of skill in the art, reading the reference, would 'at once envisage' the claimed arrangement or combination." Appx2106-2107 (alterations in original).

The Institution Decision did not address three of the five claim requirements that make up the system configuration. *See* Appx2104-2107. Instead, the Board addressed two: the first activity affecting data transmitted in response to the second activity requirement, Appx2105-2106, and the television-related/television-unrelated activity requirement, Appx2106. The Board did not explain how *Tomioka* disclosed the first activity profile update requirement, the second activity detect requirement, or the second activity access requirement, despite OpenTV's argument that the Petition lacked an explanation for these elements. Appx2082. Of the fifty paragraphs, claims, and figures of *Tomioka* cited in the Petition, the Board relied upon only paragraphs [0040], [0046], [0055], [0058], [0060], [0063], and [0069], and added a new citation to paragraph [0062]. Appx2105-2106.

D. The IPR Trial Phase

After institution, OpenTV reiterated its concerns with the Petition's lack of particularity, noting:

> Anticipation is a high bar and, "with its strict identity requirement, [is] quite rare." This is because a reference cannot anticipate "unless a reference discloses *within the four corners* of the document not only *all of the limitations* claimed but also *all of the limitations arranged or combined in the same way* as recited in the claim. . . ."

Appx2135-2136 (alteration in original) (citations omitted). OpenTV argued that Apple's general citations to large sections of *Tomioka* for the first activity profile update, second activity detect, second activity access, and first activity affecting data transmitted in response to the second activity requirements—without explaining how the reference should be applied—was insufficient to establish anticipation. Appx2139-2147.

OpenTV also argued that the problem is compounding "because the first part of the claimed configuration forms the basis for the remainder of the claimed invention and its configuration." Appx2140. For example:

> Even if there were multiple options disclosed in Tomioka, the failure [to] identify the features relied upon

> for the individual elements of this claim requirement makes it impossible to evaluate the later requirements of the claimed configuration which build upon it (e.g., the latter requirements that include elements with antecedent basis in this requirement).

Id. The highlighted claim below shows graphically how OpenTV argued that the requirements of the claimed configuration are linked together based on the respective activity (related to television viewing or unrelated to television viewing).

> 14. An interactive television system comprising:
>
> a remote unit;
>
> a set-top box; and
>
> a broadcast station coupled to convey a programming signal to the set-top box;
>
> wherein the system is configured to:
>
>> update a user profile responsive to a first user activity, the first user activity being initiated via a first device corresponding to one of the remote unit and the set-top box;
>>
>> detect a second user activity, the second user activity being initiated via a second device corresponding to one of the remote unit and the set-top box, the second device being different from the first device, wherein either
>>
>>> (i) the first user activity comprises an activity related to television viewing and the second user activity comprises an activity unrelated to television viewing, or

> (ii) the first user activity comprises an activity unrelated to television viewing and the second user activity comprises an activity related to television viewing;
>
> access the user profile in response to the second user activity; and
>
> transmit data responsive to the second user activity, wherein the transmitted data is based at least in part on the user profile, and wherein the first user activity affects a content of said data transmitted to the user responsive to the second user activity.

Appx43, 14:33-59 (annotated); Appx2136-2138; Appx2140; Appx2142-2147. OpenTV therefore argued that Apple's "failure [to] identify the features relied upon for the individual elements of th[e] claim requirement[s] makes it[s arguments] impossible to evaluate . . . ." Appx2140.

In addition to the fatal lack of specificity, OpenTV noted other problems in the Petition and Institution Decision. With respect to specific claim requirements, OpenTV argued:

First activity profile update: For this claim requirement, OpenTV pointed out that the Petition failed to identify the features of *Tomioka* it relied upon to disclose that the update is "responsive to a first user activity" or to disclose the elements in "the first user activity being initiated via a first device corresponding to one of the remote unit and the set-top box." Appx2140.

Television-related/television-unrelated activity requirement: For this claim requirement, OpenTV explained that "the Petition never points to any embodiment using ***both*** activities 'related to television viewing' and 'unrelated to television viewing' with regard to the user profile." Appx2143. OpenTV further explained:

> Instead of identifying a single embodiment disclosing both activities, the linchpin of Petitioner's argument is the empty assertion that "Tomioka discloses description schemes that may be used across such services. Id. ¶ 0065." Notably, this sentence omits the word "user" from *description scheme* because the Petition is pointing to features of the "program description scheme"—not the "user description scheme." *See* Ex. 1003, ¶ [0065] (discussing the "program description scheme"). The program description scheme is not a user profile and attempting to combine features of the program description scheme with a user profile would be improper. *Net MoneyIN*, 545 F.3d at 1371 (holding anticipation cannot be based on combining separate parts of a reference).

Appx2142-2144.

Second activity access: For this claim requirement, OpenTV pointed out that beyond block quoting and string citing nine paragraphs and two figures, the Petition only asserts that "Tomioka discloses accessing the user profile to deliver content to the user on multiple devices." Appx2144 (quoting Appx2018-2019). But, OpenTV continued, "A disclosure of 'accessing the user profile to deliver content to the user on multiple devices' . . . differs from 'access[ing] the user profile *in response to the second user activity,'* as required by the claims." *Id.* (alteration in original).

First activity affecting data transmitted in response to the second activity: For this claim requirement, OpenTV pointed out that neither the Board nor the Petition addressed the first part of this claim requirement: the data is transmitted responsive to the second user activity. Appx2146-2147. OpenTV also argued that recording, presenting, and discovering relied upon in the Institution Decision and the Petition differ from a singular claim requirement of "transmitting." *Id*. But OpenTV explained that the Petition "never identifies how Tomioka discloses that 'the first user activity affects a content of said data transmitted to the user responsive to the second user activity.'" Appx2146-2147. For example, using the Petition's examples of television and radio from earlier parts of the claimed configuration, OpenTV explained that "the Petition fails to identify any example where history information for radio activity is used to transmit content in response to television activity." Appx2147.

OpenTV also explained that the Petition failed to account for the express disclosure in *Tomioka* that when the device or media types are different, "multiple separate user preference descriptions" are needed. *Id.* Thus, OpenTV argued that, even if *Tomioka* discloses recording history information based on web browsing, radio, and television usage, this is different from the combination required by the claims: *Tomioka* does not disclose that the web browsing or radio activity (first user activity) affects content of data transmitted to the user responsive to the television activity (second user activity). *Id.*

In response to Patent Owner's argument that the Petition did not explain how to map *Tomioka* to the claimed system configuration, Appx2139-2147, Apple's Reply introduced a new roadmap based in part on the claim charts in the Petition. In doing so, Apple also added a new explanation and mapped new parts of the reference to particular claim elements.

For every element of the claimed system configuration, Apple's Reply roadmap included both narrowing the Petition's string cites and adding new citations:

First activity profile update: The twenty-two sections of *Tomioka* cited in the Petition, Appx2018, Appx2027-2029, were reduced to six, two of which—paragraphs [0037] and [0038]—were newly mapped to this claim requirement, Appx2155-2156.

The second activity detect requirement: The sixteen sections of *Tomioka* cited in the Petition, Appx2018-2019, Appx2029, were reduced to four, half of which were new—paragraphs [0037] and [0061—for this requirement, Appx2157-2158. In addition to the new citations, the Reply roadmap also added new argument based on paragraph [0061] of *Tomioka* to this requirement. Appx2158.

Television-related/television-unrelated activity requirement: The nineteen sections of *Tomioka* cited in the Petition, Appx2020-2021, Appx2029-2031, were reduced to twelve, five of which were new—paragraphs [0040], [0088], [0089], [0094], and [0109]—for this requirement, Appx2159-2161. Apple also supplemented its citation to its declaration to introduce paragraph 73, accusing OpenTV of "ignor[ing]" this previously uncited portion of the declaration. Appx2159.

Second activity access: The sixteen sections of *Tomioka* cited in the Petition, Appx2018-2019, Appx2013, were reduced to five, with two new mappings—paragraphs [0037] and [0097]—for this requirement, Appx2161.

First activity affecting data transmitted in response to the second activity: The twenty-one sections of *Tomioka* cited in the Petition, Appx2019-2020, Appx2031-2033, were reduced to fourteen, including new paragraphs [0037], [0052], [0059], [0104] and [0106] mapped to this requirement, Appx2162-2166. Apple's Reply roadmap also added new argument for the claimed "transmitting" based on the new citation to paragraph [0104]. Appx2162.

The Reply was also the first time, *see* Appx2140, Appx2144-2146, Apple or the Board addressed the causal relationship between the first and second activities and the performance of particular steps. Apple first explained in its Reply how the purported "update" in *Tomioka* could be "responsive to a first user activity," Appx2156; how the alleged "access" in *Tomioka* could be "in response to the second user activity," Appx2161; and how the transmission could be "responsive to the second user activity," Appx2163.

Prior to the oral hearing, the Board convened a call to address objections to the parties' demonstratives for the hearing. During that call, Apple objected to OpenTV's demonstratives for including slides identifying new arguments and citations that Apple added in its Reply. Appx3022-3023. Apple argued that OpenTV should not be permitted to raise the issue of new Reply arguments at the hearing, but the Board disagreed. Appx3022-3023, 13:22-14:4. The Board explained:

> [T]he board has on numerous occasions informed the patent owner that they may bring up an argument that new material was presented -- or new arguments or evidence were presented from the reply during the oral hearing. I would draw your attention just as an example to IPR2014-00153, paper 18, page 3, you can look at that at your convenience.

Id. That case denied a special request to file a motion to strike a reply because "the panel can determine for itself whether the Reply raises new issues or evidence that should have been submitted with the Petition, and can discount any such arguments accordingly." *Adobe Sys. Inc. v. Afluo, LLC*, IPR2014-00153, Paper 18 at 2 (PTAB Sept. 18, 2014).Patent Owner "can note during the oral hearing which arguments and evidence it believes are new. In doing so, Patent Owner can create a record and notify the panel of the alleged new issues and evidence." *Id.* at 3. The Board rules do not provide a procedure for objecting to or striking a reply for containing new evidence or arguments, but provide that: "A reply may only respond to arguments raised in the corresponding opposition, patent owner preliminary response, or patent owner response." 37 C.F.R. § 42.23(b). The Board's Trial Practice Guide states that "a reply that raises a new issue or belatedly presents evidence will not be considered." Office Patent Trial Practice Guide, 77 Fed. Reg. 48,756, 48,767 (Aug. 14, 2012).

The Board also rejected Apple's argument that OpenTV should have presented its improper reply argument via a motion to exclude, citing prior instances where the Board ruled that objections to new evidence in a reply were not proper in a motion to exclude. Appx3023, 16:3-11.

At the oral hearing, OpenTV argued that Apple's Reply was improper because it included new arguments, Appx1026-1029, and objected to Apple's use of demonstratives providing a "new rationale" and a "new claim mapping," Appx1046. During the hearing, the Board questioned Apple on this point:

> I think Patent Owner does have a point, that you -- it started out in the Petition citing gobs and gobs of material for each particular claim limitation, and then you took the Reply as an opportunity to narrow that to be much more precise.
>
> And then we see this sort of repeated over again here at the hearing, where you come in to the hearing with 99

> slides. I've never seen a party come in with 99 slides and then present only a fraction of those.
>
> At what point does this become almost a bad-faith attempt to hide your position from Patent Owner?

Appx1053-1054.

OpenTV also argued that Apple's anticipation case improperly combined separate embodiments of *Tomioka*. Appx2143-2144. In response, Apple argued that the various disclosures of *Tomioka* are "variations" of a single embodiment, and "*Kennametal* addressed a situation where there were actually different embodiments, but the Board found that the disclosure -- if one of those taught one of ordinary skill to envisage the claims, that's sufficient." Appx1017-1018 (citing *Kennametal*).

E. Final Written Decision

In the Final Written Decision, the Board noted that "Patent Owner contends that Petitioner's use of string citations and its reliance on the quotation of these paragraphs in its claim chart fails to identify the disclosures of Tomioka relied upon in the Petition with the necessary specificity." Appx13. Nonetheless, the Board ruled that there was "sufficient specificity for [the Board] to understand and evaluate Petitioner's arguments." Appx13-14.

Unlike the Institution Decision, which addressed only two of the claim requirements, the Final Written Decision introduced the Board's analysis for the rest of the claim requirements. For each claim requirement, the Board summarized the parties' arguments, but did not address several of OpenTV's arguments.

First activity profile update requirement: The Board did not respond to the argument that "the Petition fails to identify the features of Tomioka it relies upon to disclose that the update is 'responsive to a first user activity' or to disclose the elements in 'the first user activity being initiated via a first device corresponding to one of the remote unit and the set-top box.'" Appx2140.

Television-related/television-unrelated activity requirement: The Board did not respond to the argument that Apple's position that the user description scheme includes ***both*** activities "related to television viewing" and "unrelated to television viewing" was based on a discussion of a "program description scheme"—not a "user description scheme." Appx2143.

Second activity access requirement: the Board did not respond to the argument that a disclosure of "accessing the user profile to deliver content to the user on multiple devices" differs from "access[ing] the user profile *in response to the second user activity*," as required by the claims. Appx2144.

First activity affecting data transmitted in response to the second activity requirement: The Board did not respond to two arguments from the Patent Owner's Response: that the Petition never identifies how *Tomioka* discloses that "the first user activity affects a content of said data transmitted to the user responsive to the second user activity" in the claimed context, Appx2146-2147, and that *Tomioka* expressly recognized that when the device or media types are different, there is a need to "maintain multiple separate user preference descriptions," Appx2147.

The Board also relied upon new evidence in the Final Written Decision. For example, for the second activity access requirement, the Board's conclusions about what "a person of ordinary skill in the art would understand" rest on a conclusion from Apple's declarant relating to "necessity" that was not part of the anticipation grounds during trial. Appx17 (newly citing Appx2876, ¶ 72).

Some of the Board's conclusions in the Final Written Decision only generally cite to various parts in the record. For example, at Appx14 n.6, the Board generally cites Appx2153, Appx2156-2157, and Appx1053-1055, 54:16-56:10, for why particularity arguments were unpersuasive. Similarly, for the second activity access requirement, the Board generally cites Appx2020-2023, Appx2031, and Appx2875-2876, ¶¶ 70-72, after its conclusion. Appx17. Sometimes, the Board cites to portions of the record discussing other claim elements. For example, for the first activity profile update requirement, the Final Written Decision cites the Petition's discussion of the second activity transmit based on first activity requirement. *Compare* Appx12, *with* Appx2022. Similarly, for the second activity access requirement, the Final Written Decision cites the Petition's discussion of the first activity affecting data transmitted in response to the second activity requirement and several dependent claims. *Compare* Appx17, *with* Appx2020-2023.

For one of the claim elements previously addressed in the Institution Decision, the Board modified and supplemented the basis for its findings. For the transmit requirement, the Board's final analysis relies on the new paragraph [0104] that was mapped to this claim element for the first time in the Reply. Appx19 (citing Appx2516, ¶ [0104]). This paragraph of *Tomioka* was not mapped to the transmitting element in either the Petition, *see supra* § VI.F, or in the Board's mapping of the transmitting element in the Institution Decision, *see id*.

F. Summary of Evolving Claim Mappings During the Proceeding

The table below summarizes the evidence mapped to each element of the claimed system configuration in each of the papers over the course of the proceeding. In the table, white denotes evidence cited in the Petition, blue denotes evidence added in the Institution Decision, yellow denotes evidence added in the Reply, green denotes evidence added in the Final Written Decision, and a red outline indicates the evidence relied upon in the Final Written Decision.

First Activity Profile Update Requirement

¶62 ¶90 ¶91 ¶94 ¶122 ¶97 ¶46 ¶55 ¶58 ¶41 ¶42 ¶63 ¶95 ¶98

¶103 ¶104 Fig. 2 Fig. 25 Fig. 27 Fig. 28 Cl. 12 ¶37 ¶38 ¶76

Petition	**Institution Decision**	**Reply**	**Final Written Decision**
Prose: *Tomioka*, ¶¶ [0046], [0055], [0058], [0062], [0063], [0090], [0091], [0094], [0095], [0097], [0098], [0122], Claim 12, Figs. 2, 25, 27, 28 Chart: *Tomioka*, ¶¶ [0041], [0042], [0046], [0055], [0058], [0062], [0063], [0090], [0091], [0094], [0095], [0097], [0098], [0103], [0104], [0122]	Claim Element Not Addressed	Newly Cited: *Tomioka*, ¶¶ [0037], [0038] Previously Cited: *Tomioka*, ¶¶ [0046], [0058], [0062], [0097]	Newly Cited: *Tomioka*, ¶ [0076][2] Previously Cited: *Tomioka*, ¶¶ [0058], [0062], [0063], [0090], [0091], [0095], [0097], [0122]

[2] This may be a typographical error in the Final Written Decision.

Second Activity Detect Requirement

¶42 | ¶57 | ¶60 | ¶95 | ¶97 | ¶38 | ¶69 | ¶40 | ¶46 | ¶58 | ¶62 | ¶91 | ¶104 | Fig. 1

Fig. 2 | Fig. 28 | ¶37 | ¶61 | ¶41

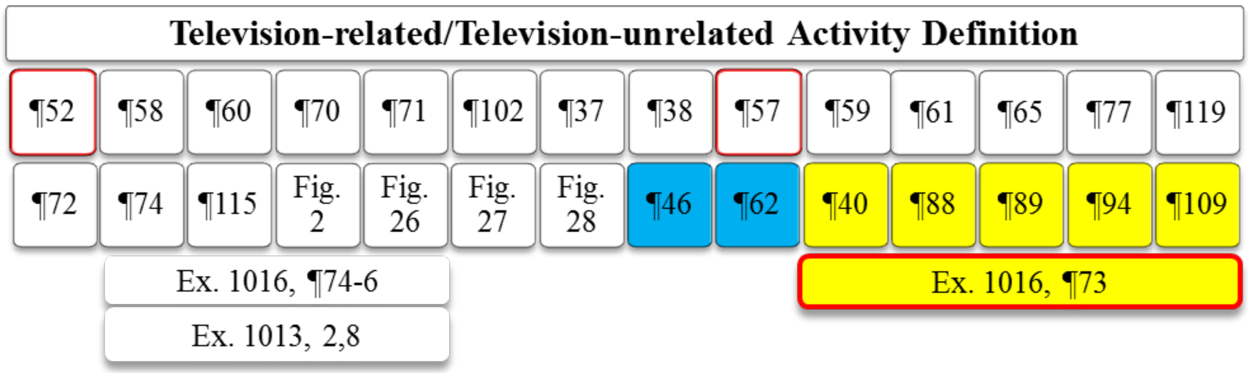
Ex. 1016, ¶67

Ex. 1010, 282

Ex. 1011, 168-9

Petition	**Institution Decision**	**Reply**	**Final Written Decision**
Prose: *Tomioka*, ¶¶ [0040], [0042], [0046], [0058], [0062], [0095], [0104], Figs. 1, 2 Chart: *Tomioka*, ¶¶ [0038], [0040], [0042], [0046], [0057], [0058], [0060], [0062], [0069], [0091], [0095], [0097], Figs. 1, 2, 28	Claim Element Not Addressed	Newly Cited: *Tomioka*, ¶¶ [0037], [0061], Apple Ex. 1016, ¶ 67 Apple Ex. 1010, 282 Apple Ex. 1011, 168-69 Previously Cited: *Tomioka*, ¶¶ [0058], [0097]	Newly Cited: *Tomioka*, ¶ [0041][3] Previously Cited: *Tomioka*, ¶ [0042], Figs. 1, 2

[3] The Final Written Decision cites to the Petition "quoting" paragraph [0041] of *Tomioka* apparently because the Petition incorrectly cited paragraph [0042].


Television-related/Television-unrelated Activity Definition
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¶58
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¶102
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¶77
¶119
¶72
¶74
¶115
Fig. 2
Fig. 26
Fig. 27
Fig. 28
¶46
¶62
¶40
¶88
¶89
¶94
¶109
Ex. 1016, ¶74-6
Ex. 1013, 2,8
Ex. 1016, ¶73

Petition	**Institution Decision**	**Reply**	**Final Written Decision**
Prose: *Tomioka*, ¶¶ [0052], [0057], [0058], [0060], [0065], [0071], [0077], [0119] Apple Ex. 1016, ¶¶ 74-76 Apple Ex. 1013, 2, 8 Chart: *Tomioka*, ¶¶ [0037], [0038], [0052], [0057]-[0061], [0065], [0070]-[0072], [0074], [0102], [0115], Figs. 2, 26-28	Newly Cited: *Tomioka*, ¶¶ [0046], [0062]	Newly Cited: *Tomioka*, ¶¶ [0040], [0088], [0089], [0094], [0109] Apple Ex. 1016, ¶ 73 Previously Cited: *Tomioka*, ¶¶ [0037], [0038], [0046], [0057], [0058], [0061], [0062] Apple Ex. 1016, ¶¶ 74-76	Previously Cited: *Tomioka*, ¶¶ [0052], [0057] Apple Ex. 1016, ¶ 73

Second Activity Access Requirement

¶40	¶42	¶46	¶58	¶62	¶95	¶91	¶60	¶63	¶38	¶41	¶57	¶104	Fig. 1
Fig. 2	Fig. 28	¶37	¶97	Ex. 1016 ¶70-72									

Petition	Institution Decision	Reply	Final Written Decision
Prose: *Tomioka*, ¶¶ [0040], [0042], [0046], [0058], [0062], [0095], [0104], Figs. 1, 2 Chart: *Tomioka*, ¶¶ [0038], [0040], [0041], [0057], [0058], [0060], [0063], [0091], [0104], Figs. 2, 28	Claim Element Not Addressed	Newly Cited: *Tomioka*, ¶¶ [0037], [0097] Previously Cited: *Tomioka*, ¶¶ [0038], [0040], [0057]	Newly Cited: Apple Ex. 1016, ¶¶ 70-72 Previously Cited: *Tomioka*, ¶¶ [0040], [0058], [0060], [0063]

First Activity Affecting Data Transmitted In Response To The Second Activity Requirement

¶40 ¶55 ¶57 ¶63 ¶91 ¶92 ¶93 ¶98 ¶115 ¶123 ¶01 ¶38 ¶46 ¶50

¶58 ¶60 ¶68 ¶69 ¶71 Fig. 2 Fig. 28 ¶62 ¶37 ¶52 ¶59 ¶104 ¶106

Petition	**Institution Decision**	**Reply**	**Final Written Decision**
Prose: *Tomioka*, ¶¶ [0040], [0055], [0063] Chart: *Tomioka*, ¶¶ [0001], [0038], [0040], [0046], [0050], [0055], [0057], [0058], [0060], [0063], [0068], [0069], [0071], [0091]-[0093], [0098], [0115], [0123], Figs. 2, 28	Newly Cited: *Tomioka*, ¶ [0062] Previously Cited: *Tomioka*, ¶¶ [0040], [0046], [0055], [0058], [0060], [0063], [0069]	Newly Cited: *Tomioka*, ¶¶ [0037], [0052], [0059], [0104], [0106] Previously Cited: *Tomioka*, ¶¶ [0040], [0046], [0055], [0058], [0060], [0063], [0068], [0091]-[0093]	Previously Cited: *Tomioka*, ¶¶ [0040], [0063], [0092], [0093], [0104]

V. SUMMARY OF THE ARGUMENT

The Final Written Decision violates the APA in three ways. First, the Board relied on new evidence and argument added by Apple after OpenTV's opportunity to provide a meaningful response had passed. Specifically, the Final Written Decision relied upon the argument that paragraph [0104] of *Tomioka*—first cited in the Reply—discloses the claimed the first activity affecting data transmitted in response to the second activity requirement. While the Board's analysis also cites to other portions of *Tomioka*, new paragraph [0104] is the only embodiment that discusses something being "transmitted." Appx19 (citing Appx2516, ¶ [0104]). Because the Final Written Decision relied on the essential mapping of *Tomioka* paragraph [0104] to the second activity transmit based on first activity requirement first introduced in Petitioner's Reply, the Final Written Decision should be remanded if it is not reversed.

Second, the Final Written Decision changed the Board's theories presented at institution, relying on a previously uncited portion of the record. For example, the Final Written Decision relied on a statement in paragraph 72 of Apple's expert declaration (Ex. 1016) for what a "person of ordinary skill in the art would understand" from the disclosure of *Tomioka* with respect to the claimed access the user profile requirement. Appx17 (citing Appx2875-2876, ¶¶ 70-72). Significantly, paragraph 72 asserts not that "access the user profile in response to a second user activity" is expressly disclosed by *Tomioka*, but rather that it is "necessarily the case" that *Tomioka* is configured that way. *See supra* § IV.E. A reference "necessarily" disclosing a claim element can only support anticipation where inherency is argued, *see In re Robertson*, 169 F.3d 743, 745 (Fed. Cir. 1999), but here, Apple did not make that case. Because the Final Written Decision adds a new, essential mapping and inherency theory that was not advanced by the Petitioner, the Final Written Decision should be reversed.

Third, the Final Written Decision is deficent because it mostly summarizes—incompletely and inaccurately—the parties' arguments and fails to explain why Apple's arguments prevailed over OpenTV's. The Board's argument summaries are particularly unhelpful because (i) the summaries are unclear regarding which legal theory the Board relies upon; (ii) the summaries omit almost all of OpenTV's arguments; and (iii) several of the summaries are inaccurate. For example, in the Final Written Decision, the Board mostly summarized the parties' arguments and indicated its conclusion was "for the reasons explained by Petitioner" rather than explaining why it drew its conclusion. Appx16. In one particularly eggregious instance, the Board simply stated that "[w]e disagree" with Patent Owner's argument that recording, presenting, and discovering is not the same thing as the claimed transmitting, Appx18, but it provided no explanation why, Appx18-19. The Board also supported its position on several elements with seemingly inaccurate citations to different parts of the Petition. *See supra* § IV.E. Accordingly, the Final Written Decision should be remanded if it is not reversed.

The Final Written Decision also fails to identify substantial evidence that *Tomioka* discloses the first activity affecting data transmitted in response to the second activity requirement. The Board did not identify any particular teaching in *Tomioka* as disclosing combining the radio and television embodiments so that history information for radio activity would be used to transmit content in response to television activity, providing the link required by the claims. Instead, as best understood, the Board's reasoning appears to be that the claim is anticipated under *Kennametal* because a person of ordinary skill in the art faced with the variations of *Tomioka*'s system would "at once envisage" the missing link between two different types of activity required by the claim language:

> ***[T]he first user activity comprises an activity related to television viewing and the second user activity comprises an activity unrelated to television viewing***,
>
> **. . .**
>
> ***transmit data responsive to the second user activity***, wherein the transmitted data is based at least in part on the user profile, and ***wherein the first user activity affects a content of said data transmitted to the user responsive to the second user activity***.

Appx43, 14:33-59 (emphasis added). This is legally incorrect. "*Kennametal* does not stand for the proposition that a reference missing a limitation can anticipate a claim if a skilled artisan viewing the reference would 'at once envisage' the missing limitation." *Nidec*, slip op. at 7. Because the Final Written Decision fails to cite any evidence where television-related activities affect the content transmitted in response to non-television-related activities, substantial evidence does not support the Board's conclusion that *Tomioka* meets the high bar of anticipation. Accordingly, the Final Written Decision should be reversed.

VI. ARGUMENT

A. Standard of Review

This court "review[s] the Board's compliance with the governing legal standards de novo." *Belden Inc. v. Berk-Tek LLC*, 805 F.3d 1064, 1073 (Fed. Cir. 2015). And, "[u]nder the Administrative Procedure Act, [this court] must 'hold unlawful and set aside agency action . . . not in accordance with law [or] . . . without observance of procedure required by law." *In re NuVasive, Inc.*, 841 F.3d 966, 970 (Fed. Cir. 2016) (third alteration in original) (quoting 5 U.S.C. § 706(2)(D)). The court must also hold unlawful and set aside agency action, findings, and conclusions found to be arbitrary, capricious, an abuse of discretion, or unsupported by substantial evidence. 5 U.S.C. § 706(2)(A).

Anticipation is a question of fact reviewed for substantial evidence. *REG Synthetic Fuels, LLC v. Neste Oil Oyj*, 841 F.3d 954, 958 (Fed. Cir. 2016).

B. The Board Violated the APA in Multiple Ways When It Found OpenTV's Claims Unpatentable

The Final Written Decision violates the APA in three ways. First, the Board relied on new evidence and argument added by Apple after OpenTV's opportunity to provide a meaningful response had passed. Second, the Final Written Decision changed the Board's theories presented at institution, relying on a previously uncited portion of the record. Third, the Final Written Decision is deficent because it mostly summarizes—incompletely and inaccurately—the parties' arguments and fails to explain why Apple's arguments prevailed over OpenTV's. Accordingly, the Final Written Decision should be reversed or, at a minimum, remanded.

1. The Board violated 35 U.S.C. § 312 and the APA by relying on evidence and arguments raised for the first time in Petitioner's Reply.

The Final Written Decision should be reversed because it relies on new claim mappings and evidence first introduced in Apple's Reply, in violation of 35 U.S.C. § 312 and §§ 554 and 556 of the APA (codified as 5 U.S.C. §§ 554, 556). Interpreting the requirement of 35 U.S.C. § 312, this court has noted that, "[u]nlike district court litigation—where parties have greater freedom to revise and develop their arguments over time and in response to newly discovered material—the expedited nature of IPRs bring[s] with it an obligation for petitioners to make their case in their petition to institute." *Intelligent Bio-Sys.*, 821 F.3d at 1369. Indeed, 37 C.F.R. § 42.23(b) states that "[a] reply may only respond to arguments raised in the corresponding opposition, patent owner preliminary response, or patent owner response." And the Board's Trial Practice Guide governing IPR proceedings makes clear that "a reply that raises a new issue or belatedly presents evidence will not be considered . . . ." 77 Fed. Reg. at 48,767. "While the Board's requirements are strict ones, they are requirements of which petitioners are aware when they seek to institute an IPR." *Intelligent Bio-Sys.*, 821 F.3d at 1369. In addition to the requirements of § 312, this court has also found this procedure necessary under the APA because allowing the petitioner to refine and develop its argument in the Reply fails to provide the patent owner with the notice and opportunity to respond that the APA requires. *See NuVasive*, 841 F.3d at 971-72.

At oral argument, the Board questioned Apple for filing a "Petition citing gobs and gobs of material for each particular claim limitation, and then [taking] the Reply as an opportunity to narrow that to be much more precise." Appx1053. And the Board asked Apple, "At what point does this become almost a bad-faith attempt to hide your position from Patent Owner?"[4] Appx1054. Regardless of Apple's general assertion about "central arguments" in the Petition, *id.*, Apple's Reply refined and added to its mappings for every limitation of the claimed system configuration, *see supra* §§ IV.D, IV.F. This violated 35 U.S.C. § 312, *Intelligent Bio-Sys.*, 821 F.3d at 1369, and could not have provided the notice required by the APA, *NuVasive*, 841 F.3d at 971-72.

The Final Written Decision does not expressly address the issue of whether the Reply contained new arguments, but it relied on at least one new argument introduced in the Petitioner's Reply. *See supra* §§ IV.E, IV.F. In particular, the Board relied on a new claim mapping for an essential part of the claimed configuration—the first activity affecting data transmitted in response to the

[4] Acting in bad faith is not required to violate 35 U.S.C. § 312 or the notice requirement of the APA.

second activity requirement that requires two different types of activities, one related to television and one unrelated to television. *See id*. Over the course of the proceeding, Petitioner's and the Board's mappings for this element were revised and refined as follows:

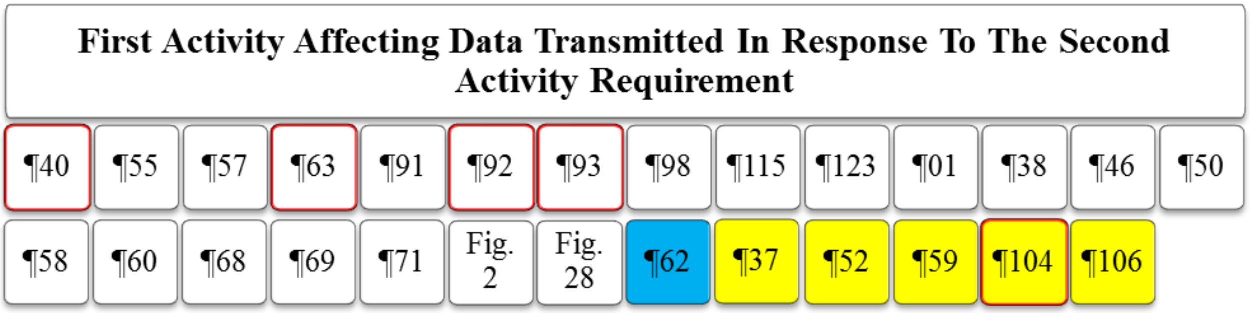
First Activity Affecting Data Transmitted In Response To The Second Activity Requirement
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Fig. 2
Fig. 28
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¶106

Petition	**Institution Decision**	**Reply**	**Final Written Decision**
Prose: *Tomioka*, ¶¶ [0040], [0055], [0063] Chart: *Tomioka*, ¶¶ [0001], [0038], [0040], [0046], [0050], [0055], [0057], [0058], [0060], [0063], [0068], [0069], [0071], [0091]-[0093], [0098], [0115], [0123], Figs. 2, 28	Newly Cited: *Tomioka*, ¶ [0062] Previously Cited: *Tomioka*, ¶¶ [0040], [0046], [0055], [0058], [0060], [0063], [0069]	Newly Cited: *Tomioka*, ¶¶ [0037], [0052], [0059], [0104], [0106] Previously Cited: *Tomioka*, ¶¶ [0040], [0046], [0055], [0058], [0060], [0063], [0068], [0091]-[0093]	Previously Cited: *Tomioka*, ¶¶ [0040], [0063], [0092], [0093], [0104]

See supra § IV.F.

The Final Written Decision relied upon the argument that paragraph [0104] of *Tomioka*—first cited in the Reply roadmap—discloses the claimed first activity affecting data transmitted in response to the second activity requirement. *See supra* §§ IV.D, IV.E, IV.F. For this claim element, OpenTV's Preliminary Response pointed out that "the petition maps more than 30 paragraphs of the Tomioka reference, spanning multiple, alternative embodiments, as being relevant to this claim feature without explanation of how those features allegedly disclose the claimed interaction," which includes the claimed second activity transmit based on first activity requirement. Appx2082. At institution, the Board cited eight paragraphs of *Tomioka*, one of which was new, for this transmit claim element. *See supra* §§ IV.D, IV.F. When OpenTV argued that the Board and Apple did not address that data is transmitted in response to the second user activity, Appx2146, Apple introduced a new mapping to *Tomioka*, Appx2162, ¶ [0104], which the Board relied on in the Final Written Decision, Appx19. The Board erred by allowing Apple to shift its arguments in the Reply, *Intelligent Bio-Sys.*, 821 F.3d at 1369, and by resting its Final Written Decision on belated evidence, *NuVasive*, 841 F.3d at 971-72.

This outcome is not changed by this Court's decision in *Genzyme Therapeutic Products Ltd. v. Biomarin Pharmaceutical Inc.*, 825 F.3d 1360 (Fed. Cir. 2016), because here the Board's reliance on newly cited evidence was not just describing the state of the art, Appx19, and OpenTV was not able to address the newly cited paragraph in its Patent Owner's Response. *Id.*; *see also Genzyme*, 825 F.3d at 1368-69. Likewise, *Belden* does not change the outcome here. In *Belden*, the Final Written Decision cited explanatory evidence introduced in the Reply that the Board expressly ruled was not needed to establish petitioner's *prima facie* case. 805 F.3d at 1078-79. Here, the new evidence (paragraph [0104] of *Tomioka*) is relied upon to teach a claim element, so it is not merely explanatory. Instead, Apple must have made its *prima facie* case of anticipation, including every element arranged as in the claims, in its Petition. *Intelligent Bio-Sys.*, 821 F.3d at 1369.

Because the Final Written Decision relied on the essential mapping of *Tomioka* paragraph [0104] to the the second activity transmit based on first activity requirement first introduced in Petitioner's Reply, the Final Written Decision should be remanded if it is not reversed.

2. The Board violated the APA by changing its theory of unpatentability midstream and relying on evidence never cited by either party.

The Final Written Decision should also be reversed because the Board improperly changed its theory of unpatentability to include an argument not advanced by Apple. Under § 554 of the APA, "'an agency may not change theories in midstream without giving respondents reasonable notice of the change' and 'the opportunity to present argument under the new theory.'" *SAS Inst., Inc. v. ComplementSoft, LLC.*, 825 F.3d 1341, 1351 (Fed. Cir. 2016) (quoting *Belden*, 805 F.3d at 1080), *petition for cert. filed*, 85 U.S.L.W. 3377 (U.S. Jan. 31, 2017) (No. 16-969). There, the Board erred by changing its claim construction from institution to final decision. *Id*.

Likewise, this Court reversed the Board when it failed to provide a sufficient rationale for a prior art combination because "[t]he Board is [not] free to adopt arguments on behalf of petitioners that could have been, but were not, raised by the petitioner during an IPR." *Magnum Oil*, 829 F.3d at 1381. "Instead, the Board must base its decision on arguments that were advanced by a party, and to which the opposing party was given a chance to respond." *Id*.

Like in *SAS* and *Magnum Oil*, the Board here improperly found OpenTV's claims unpatentable based on a new theory first introduced in the Final Written Decision, where it relied on a new mapping and introduced an inherency argument that was not advanced by the Petitioner. To support the conclusion that the claims are anticiplated, the Board relied on a statement in paragraph 72 of Apple's expert declaration (Ex. 1016) for what a "person of ordinary skill in the art would understand" from the disclosure of *Tomioka* with respect to the claimed access the user profile requirement. Appx17 (citing Appx2875-2876, ¶¶ 70-72). This testimony was not cited in the Petition or the Reply as part of Apple's argument that the claims are anticipated. *See supra* §§ IV.C, IV.D, IV.F.[5] And, of the evidence cited by the Board, this is the only thing that purportedly explains how one could get from the disclosures in *Tomioka* to the claim requirement of a user profile being accessed in response to a second user activity. *See* Appx17; *see also* Appx2875-2876, ¶¶ 70-72.

Significantly, in new paragraph 72, Apple's expert contends not that "access the user profile in response to the second user activity" is expressly disclosed by *Tomioka*, but rather that it is "necessarily the case" that *Tomioka* is configured that way. Appx2876, ¶ 72. A reference "necessarily" disclosing a claim element can only support anticipation where inherency is argued, *see Robertson*, 169 F.3d at 745, but here, Apple did not make that case. Appx2016-2022. Instead, the Petition did not explain what it relied upon to teach the "in response to" part of this claim requirement, *see supra* § IV.D, and the Reply presented a new argument that this element of the claim is disclosed because *Tomioka*'s profile is accessed "in *response* to users *using* those devices," Appx2161. But rather than adopt Apple's evidence and reasoning for this claim element, the Board impermissibly took it upon itself to seek out a new inherency-based argument from a different part of the

[5] Paragraph 72 was cited in another part of the Petition to support a noninstituted obviousness ground, *see supra* § IV.C, but that does not "identify 'with particularity' the 'evidence that supports'" the anticipation ground. *See Intelligent Bio-Sys.*, 821 F.3d at 1369 (quoting 35 U.S.C. § 312(a)(3)).

declaration. *See supra* § IV.E. But "while the PTO has broad authority to establish procedures for revisiting earlier-granted patents in IPRs, that authority is not so broad that it allows the PTO to raise, address, and decide unpatentability theories never presented by the petitioner and not supported by record evidence." *Magnum Oil*, 829 F.3d at 1381. In this case, even if the Board did have the authority, the conclusory statement in the declaration would fail to meet the legal requirement that, "[t]o establish inherency, the extrinsic evidence 'must make clear that the missing descriptive matter is necessarily present in the thing described in the reference, and that it would be so recognized by persons of ordinary skill.'" *Robertson*, 169 F.3d at 745 (citation omitted).

Because the Final Written Decision adds a new, essential mapping and an inherency theory that was not advanced by the Petitioner, the Final Written Decision violated the APA, *SAS*, 825 F.3d at 1351, and should be reversed.

3. Coupled with Apple's inadequate Petition and evolving theories, the lack of explanation in the Final Written Decision leaves OpenTV in the dark about why its claims have been held unpatentable.

The Supreme Court and the Federal Circuit have long recognized that the Board must explain its actions. *Dickinson v. Zurko*, 527 U.S. 150, 152 (1999) (holding that the APA governs Federal Circuit reviews of the PTO's findings of fact and providing the framework for the review); *SEC v. Chenery Corp.*, 318 U.S. 80, 94 (1943). Indeed, the Agency "must examine the relevant data and articulate a satisfactory explanation for its action including a 'rational connection between the facts found and the choice made.'" *Motor Vehicle Mfrs. Ass'n v. State Farm Mut. Auto. Ins. Co.*, 463 U.S. 29, 43 (1983) (citation omitted).

In the IPR context, it is not enough for the Board to summarize and reject arguments without explaining why it accepts the prevailing argument. *In re NuVasive, Inc.*, 842 F.3d 1376, 1383 (Fed. Cir. 2016). In *NuVasive*, the Board failed to explain why a person of ordinary skill in the art would have been motivated to modify the prior art reference. *Id.* at 1383-84. Instead, the Board's analysis was mostly limited to summarizing the parties' arguments, *id*. at 1384, and the Board never explained the reasons for its findings, *id*., so the decision was vacated and remanded, *id.* at 1385. Here, where the Board relies on anticipation, the lack of explanation is even more troublesome because proving anticipation typically requires the challanger to "explain in detail how each claim element is disclosed in the prior art reference," *Schumer v. Lab. Comput. Sys., Inc.*, 308 F.3d 1304, 1315 (Fed. Cir. 2002), including how a reference discloses "all of the limitations of the claims arranged or combined in the same way as recited in the claims," *Net MoneyIN, Inc. v. VeriSign, Inc.*, 545 F.3d 1359, 1370 (Fed. Cir. 2008). Lacking proper explanation of the Board's anticipation ruling, the Final Written Decision here should at a minimum be remanded.

Here, the Board's argument summaries are particularly unhelpful because (i) the summaries are unclear regarding which legal theory the Board relies upon; (ii) the summaries omit almost all of OpenTV's arguments; and (iii) several of the summaries are inaccurate. For example, in the Final Written Decision, the Board mostly summarized the parties' arguments and indicated its conclusion was "for the reasons explained by Petitioner" rather than explaining why it drew its conclusion. Appx16. In one particularly eggregious instance, the Board simply stated that "[w]e disagree" with Patent Owner's argument that recording, presenting, and discovering is not the same thing as the claimed transmitting, Appx18, but it provided no explanation why, Appx18-19. The Board also supported its position on several elements with seemingly inaccurate citations to different parts of the Petition. *See supra* § IV.E.

OpenTV does not know why its arguments were rejected. The Final Written Decision summaries do not mention or respond to almost all of OpenTV's arguments. *See id*. As discussed above, the Board does not explain why it rejected OpenTV's arguments for the first activity profile update requirement, the television-related/television-unrelated activity requirement, the second activity access requirement, and the first activity affecting data transmitted in response to the second activity requirement. Appx18-19. Indeed, OpenTV does not even know whether these arguments were considered and rejected or simply overlooked.

OpenTV also does not know the basis for many of the Board's conclusions, which would be needed to determine whether the Board is relying upon a new theory—which would be error—or what was presented in the Petition. This is because the summaries provide general citations to various parts of the record after making conclusory statements rather than clearly articulating the Board's rationale, *see supra* § IV.E, and sometimes the cited portions are unrelated to the conclusions being drawn, *see id*. Accordingly, the Final Written Decision does not provide what this court needs to review that Decision because "it is not adequate to summarize and reject arguments without explaining why the [Board] accepts the prevailing argument." *NuVasive*, 842 F.3d at 1383.

Because the Final Written Decision lacks meaningful explanation and obfuscates what evidence the Board relies upon to support its Decision, it is unreviewable. Accordingly, if the Decision is not reversed, it should be remanded.

C. *Tomioka* Does Not Disclose "Wherein the First User Activity Affects a Content of Said Data Transmitted to the User Responsive to the Second User Activity"

Rather than specifically address how *Tomioka* discloses using history information for one type of activity to affect content transmitted in response to a different type of activity as required by the claims, the Final Written Decision relies upon what one "would 'at once envisage.'" Appx20 (quoting *Kennametal*, 780 F.3d at 1381). In the context of the parties' dispute over multiple embodiments in *Tomioka*, the Board explained that it "read[s] Figures 22-27 and the accompanying text to describe variations of the embodiment of Figure 1, rather than alternative embodiments." *Id*. In support, the Board cited *Kennametal*, 780 F.3d at 1381, for the proposition that "a reference can anticipate a claim even if it 'd[oes] not expressly spell out' all the limitations arranged or combined as in the claim, if a person of skill in the art, reading the reference, would 'at once envisage' the claimed arrangement or combination." *See supra* § IV.E. However, this Court has since clarified that in *Kennametal*, "the relevant question was 'whether the number of categories and components disclosed in [the prior art reference] is so large that the combination of ruthenium and PVD coatings would not be immediately apparent to one of ordinary skill in the art.'" *Nidec*, slip op. at 7 (alteration in original) (quoting *Kennametal*, 780 F.3d at 1382). "*Kennametal* does not stand for the proposition that a reference missing a limitation can anticipate a claim if a skilled artisan viewing the reference would 'at once envisage' the missing limitation." *Id.* (quoting *Kennametal*, 780 F.3d at 1381).

The Board questioned Petitioner about combining embodiments at oral argument, and Apple responded that "*Kennametal* addressed a situation where there were actually different embodiments, but the Board found that the disclosure -- if one of those taught one of ordinary skill to envisage the claims, that's sufficient." *See supra* § IV.E. The Board noted this position in its Final Written

Decision, Appx20, and did not identify any particular teaching in *Tomioka* that discloses combining the radio and television embodiments so that history information for radio activity would be used to transmit content in response to television activity, providing the link required by the claims. Instead, the only evidence cited in the Final Written Decision for this claim requirement is *Tomioka*, Appx2487, ¶ [0063], which notably discloses performing **television activities** automatically based on **prior television activities**, and Appx2514, ¶ [0093], which discloses maintaining different preference and history descriptions for different device types in a user preference description. *See supra* §§ IV.E, IV.F.

As best understood, the Board's reasoning appears to be that the claim is anticipated under *Kennametal* because a person of ordinary skill in the art faced with the "variations" of *Tomioka*'s system would "at once envisage" the missing link between two different types of activity required by the claim language:

> ***[T]he first user activity comprises an activity related to television viewing and the second user activity comprises an activity unrelated to television viewing***,
>
> . . .
>
> ***transmit data responsive to the second user activity***, wherein the transmitted data is based at least in part on the user profile, and ***wherein the first user activity affects a content of said data transmitted to the user responsive to the second user activity***.

This is legally incorrect. "*Kennametal* does not stand for the proposition that a reference missing a limitation can anticipate a claim if a skilled artisan viewing the reference would 'at once envisage' the missing limitation." *Nidec*, slip op. at 7. Instead, a reference cannot anticipate "unless a reference discloses within the four corners of the document not only all of the limitations claimed but also all of the limitations arranged or combined in the same way as recited in the claim . . . ." *Net MoneyIN*, 545 F.3d at 1371. Accordingly, while *Kennametal* may permit anticipation where the disclosure of a limited number of combination possibilities discloses one of the possible combinations, it does not permit the Board to fill in missing limitations. *Nidec*, slip op. at 7.

Because the Final Written Decision fails to cite any evidence where television-related activities affect the content transmitted in response to non-television-related activities, substantial evidence does not support the Board's conclusion that *Tomioka* meets the high bar of anticipation. *Net MoneyIN*, 545 F.3d at 1371. Accordingly, the Final Written Decision should be reversed.

VII. CONCLUSION

For these reasons, the Final Written Decision should be reversed or, at a minimum, vacated and remanded.

Date: April 5, 2017

Respectfully submitted,

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Addendum

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Paper 31
Entered: September 26, 2016

UNITED STATES PATENT AND TRADEMARK OFFICE

BEFORE THE PATENT TRIAL AND APPEAL BOARD

APPLE INC.,
Petitioner,

v.

OPENTV, INC.,
Patent Owner.

Case IPR2015-01031
Patent 7,900,229 B2

Before JAMES B. ARPIN, DAVID C. MCKONE, and SCOTT C. MOORE, *Administrative Patent Judges*.

ARPIN, *Administrative Patent Judge*.

FINAL WRITTEN DECISION
35 U.S.C. § 318(a) and 37 C.F.R. § 42.73

I. INTRODUCTION

A. Background

Apple Inc. ("Petitioner") filed a Petition (Paper 1, "Pet.") to institute an *inter partes* review of claims 14–16, 19, 21, 24, 26, 28, 30, and 31 of U.S. Patent No. 7,900,229 B2 (Ex. 1001, "the '229 patent"). OpenTV, Inc. ("Patent Owner") filed a Preliminary Response (Paper 6, "Prelim. Resp."). Pursuant to 35 U.S.C. § 314, in our Decision to Institute (Paper 10, "Dec."), we instituted this proceeding as to each of the challenged claims.

Petitioner relies upon the following reference and declaration in support of its grounds for challenging the identified claims of the '229 patent:

Exhibit No.	Reference and Declaration
1003	Patent Application Publication No. EP 1 100 268 A2 to Tomioka *et al.* ("Tomioka")
1016	Declaration of Charles D. Knutson, Ph.D.

Petitioner asserts that all of the challenged claims are unpatentable on the following ground (Pet. 2–3, 11–33):

Claims	Ground	Reference
14–16, 19, 21, 24, 26, 28, 30, and 31	35 U.S.C. § 102(a)	Tomioka

After institution, Patent Owner filed a Patent Owner Response (Paper 14, "PO Resp."), and Petitioner filed a Reply to the Patent Owner Response (Paper 15, "Reply"). A hearing was held on June 21, 2016, and a transcript of that hearing is part of this record. Paper 21 ("Tr.").

We have jurisdiction under 35 U.S.C. § 6(b). This decision is a Final Written Decision under 35 U.S.C. § 318(a) as to the patentability of the challenged claims. Based on the record before us, Petitioner has demonstrated, by a preponderance of the evidence, that challenged claims

14–16, 19, 21, 26, 28, and 30[1] of the ’229 patent are unpatentable, but has not demonstrated, by a preponderance of the evidence, that challenged claims 24 and 31 of the ’229 patent are unpatentable.

B. Related Matter

The parties indicate that the ’229 patent is the subject of *OpenTV, Inc. v. Apple Inc.*, Civil Action No. 3:14-cv-01622-HSG (N.D. Cal. 2014). Pet. 1; Paper 5, 2. The parties identify additional cases involving the ’229 patent, as well as other *inter partes* review proceedings involving the same parties, in their Joint Motion to Terminate. Paper 22, 3–4. Nevertheless, the parties indicate that the disputes in those additional cases have been settled and that the cases have been dismissed with prejudice. *Id.* at 3.

C. The ’229 Patent

The ’229 patent is directed to “[a] system and method for utilizing user profiles in an interactive television system.” Ex. 1001, Abstract. The system can create or update a user profile, or both, based on a user’s activity on a first device, and select data to transmit to a user on a second device based at least in part on the profile. *Id.*; *accord id.* at col. 6, l. 54–col. 7, l. 3. The Specification indicates that it was known in the art that interactive television systems could provide content other than television, and could allow for user input and personalization. *Id.* at col. 1, ll. 15–18, 30–45. It also was known that such systems frequently include “a set-top box connected to a television set and a recording device, but may consist of any number of suitable devices.” *Id.* For example, an interactive television system may include a broadcast station, a set-top box, and a remote unit,

[1] *See infra* note 2.

such as a mobile or fixed unit. *See id.* at col. 2, ll. 11–58, Abstract.

The Specification of the '229 patent teaches systems and methods in which a "user may access the system through various means," and the system "creat[es] and maintain[s] a user profile which reflects activity of the user within the system." *Id.* at col. 1, l. 63–col. 2, l. 1. A user's activity "such as television viewing" may create or update "a user profile which reflects the user's viewing activities," and the user's profile may reflect other activities such as "cell phone or other mobile unit activities and communications." *Id.* at col. 2, ll. 1–6, col. 7, ll. 18–42; *see also id.* at col. 2, l. 59–col 3, l. 2 ("The user may also input information into the user profile."), col. 13, ll. 1–3 ("Web surfing"). Information is delivered to a user on a device based at least in part on a user profile available across devices. *See id.* at col. 6, l. 64–col. 7, l. 3, col. 10, ll. 47–60. For example, "a user's cell phone activity may affect the information the user receives at home on their television, and vice versa." *Id.* at col. 2, ll. 6–10.

D. Illustrative Claim

As noted above, Petitioner challenges claims 14–16, 19, 21, 24, 26, 28, 30, and 31 of the '229 patent. Claims 14 (an interactive television system) and 26 (a computer readable storage medium) are independent. Claims 15, 16, 19, 21, and 24 depend directly or indirectly from claim 14;

and claims 28, 30, and 31 depend directly or indirectly from claim 26.[2]

Claim 14 is illustrative and is reproduced below:

> 14. An interactive television system comprising:
>
> a remote unit;
>
> a set-top box; and
>
> a broadcast station coupled to convey a programming signal to the set-top box;
>
> wherein the system is configured to:
>
> update a user profile responsive to a first user activity, the first user activity being initiated via a first device corresponding to one of the remote unit and the set-top box;
>
> detect a second user activity, the second user activity being initiated via a second device corresponding to one of the

---

[2] Claim 21 depends from claim 14 via intervening claim 20, and claim 28 depends from claim 26 via intervening claim 27. Petitioner does not challenge claim 20 or 27 expressly. *See* Pet. 30, 53–54; Ex. 1016 ¶¶ 99. Because we did not institute review of claims 20 and 27, we do not now rule on the patentability of claims 20 and 27. Nevertheless, because we instituted on the asserted ground of anticipation by Tomioka, we necessarily consider the limitations of intervening claims 20 and 27 in our evaluation of claims 21 and 28, respectively. Rules of Practice for Trials Before the Patent Trial and Appeal Board and Judicial Review of Patent Trial and Appeal Board Decisions, 77 Fed. Reg. 48612, 48619 (Aug. 14, 2012) ("To understand the scope of a dependent claim, the claims from which the dependent claim depends must be construed along with the dependent claim. Accordingly, for fee calculation purposes, each claim challenged will be counted as well as any claim from which a claim depends, unless the parent claim is also separately challenged."); *see Cuozzo Speed Techs. LLC v. Lee*, 136 S. Ct. 2131, 2154 (2016) (Alito, J., concurring in part and dissenting in part; "The problem for Cuozzo is that claim 17—*which the petition properly challenged*—incorporates all of the elements of claims 10 and 14. Accordingly, an assertion that claim 17 is unpatentable in light of certain prior art is necessarily an assertion that claims 10 and 14 are unpatentable as well." (emphasis added)).

> remote unit and the set-top box, the second device being different from the first device, wherein either
>
> > (i) the first user activity comprises an activity related to television viewing and the second user activity comprises an activity unrelated to television viewing, or
> >
> > (ii) the first user activity comprises an activity unrelated to television viewing and the second user activity comprises an activity related to television viewing;
>
> access the user profile in response to the second user activity; and
>
> transmit data responsive to the second user activity, wherein the transmitted data is based at least in part on the user profile, and wherein the first user activity affects a content of said data transmitted to the user responsive to the second user activity.

Ex. 1001, col. 14, ll. 33–59.

E. Claim Construction

Consistent with the statute and the legislative history of the AIA, we interpret claims of an unexpired patent using the broadest reasonable interpretation in light of the specification of the patent. *See* 37 C.F.R. § 42.100(b); *Cuozzo Speed Techs. LLC v. Lee*, 136 S.Ct. 2131, 2144–46 (2016). There is a presumption that claim terms are given their ordinary and customary meaning, as would be understood by a person of ordinary skill in the art in the context of the specification. *See In re Translogic Tech. Inc.*, 504 F.3d 1249, 1257 (Fed. Cir. 2007). An applicant may rebut that presumption by providing a definition of the term in the specification with reasonable clarity, deliberateness, and precision. *See In re Paulsen*, 30 F.3d 1475, 1480 (Fed. Cir. 1994). In the absence of such a definition, limitations are not to be read from the specification into the claims. *See In re Van Geuns*, 988 F.2d 1181, 1184 (Fed. Cir. 1993).

Petitioner proposed constructions for various claim terms. Pet. 8–10. Although Patent Owner did not contest expressly Petitioner's proposed claim constructions for the identified terms or present its own claim constructions for any terms (*see* Prelim. Resp. 7 n.1), Patent Owner reserved the right to provide claim constructions later, if review was instituted (*id.*). Nevertheless, Patent Owner proposed no claim constructions in its Patent Owner Response. Paper 11, 3 ("The patent owner is cautioned that any arguments for patentability not raised in the response are deemed waived."); *see* PO Resp. i ("Table of Contents"). Further, during the hearing, Petitioner confirmed that "no claim constructions are necessary" (Tr. 14:14–22), and Patent Owner stated that it "didn't find any claim constructions were necessary in this case, and we -- and the Patent Owner didn't take a position on the claim construction there. We didn't object to anything the Petitioner said about claim construction" (*id.* at 46:17–21). On this record, we remain persuaded that Petitioner's proposed constructions of the identified terms are consistent with the broadest reasonable construction of those terms in light of the Specification. *See* Dec. 7. For purposes of this Final Written Decision, however, no claim terms require express construction.

II. ANALYSIS

A. Overview

Petitioner argues that claims 14–16, 19, 21, 24, 26, 28, 30, and 31 of the '229 patent are anticipated by Tomioka. *See supra* Sec. I.A. "A claim is anticipated only if each and every element as set forth in the claim is found, either expressly or inherently described, in a single prior art reference." *Verdegaal Bros. v. Union Oil Co.*, 814 F.2d 628, 631 (Fed. Cir. 1987). The elements must be arranged as required by the claim, but this is not an *ipsissimis verbis* test. *See In re Bond*, 910 F.2d 831, 832 (Fed. Cir. 1990). "[U]nless a reference discloses within the four corners of the document not only all of the limitations claimed but also all of the limitations arranged or combined in the same way as recited in the claim, it cannot be said to prove prior invention of the thing claimed, and thus, cannot anticipate under 35 U.S.C. § 102." *Net MoneyIN, Inc. v. VeriSign, Inc.*, 545 F.3d 1359, 1371 (Fed. Cir. 2008); *accord Application of Arkley*, 455 F.2d 586 (CCPA 1972). Moreover, "it is proper to take into account not only specific teachings of the reference but also the inferences which one skilled in the art would reasonably be expected to draw therefrom." *In re Preda*, 401 F.2d 825, 826 (CCPA 1968).

For the reasons set forth below and on this record, we are persuaded that Petitioner demonstrates by a preponderance of the evidence that claims 14–16, 19, 21, 26, 28, and 30 of the '229 patent are anticipated by Tomioka; but that Petitioner fails to demonstrate by a preponderance of the evidence that claims 24 and 31 of the '229 patent are anticipated by Tomioka.

B. Asserted Grounds

1. Anticipation by Tomioka

Petitioner provides a claim chart mapping the elements of challenged claims 14–16, 19, 21, and 24 of the '229 patent onto the disclosure of Tomioka. Pet. 18–31. With respect to independent claim 26, Petitioner argues that independent claim 26 is "virtually identical" to independent claim 14, except that claim 26 recites "[a] computer-readable storage medium comprising program instructions, [or triggers to launch execution of program instructions,] wherein the program instructions are executable by a computing device." *Id.* at 31 (quoting Ex. 1001, col. 15, ll. 39–42). Thus, Petitioner relies largely on its textual explanation and claim chart with respect to claim 14 to demonstrate that Tomioka discloses each and every element of claim 26. *Id.* at 31–32.

Petitioner acknowledges that claim 26 recites program instructions stored on a computer readable medium, rather than system components, as in claim 14. *Id.* at 32. Petitioner argues, however, that "Tomioka also discloses software 'schemes,' 'modules' and 'intelligent agents' that will perform system steps, along with multiple options for storage." *Id.* at 32 (citing Ex. 1003 ¶¶ 52–55, 58, 94, 104, and Fig. 2). Thus, Petitioner argues that Tomioka discloses the use of removable storage devices or servers storing software to perform the program instructions to accomplish the recited steps of claim 26. *Id.*

Patent Owner focuses its response to Petitioner's arguments almost exclusively on recitations of independent claim 14. PO Resp. 2. Patent Owner notes that "[t]he instituted claims include two independent claims — claims 14 and 26. Claims 14 and 26 differ in scope but require similar functionality." *Id.* Patent Owner relies on its contentions with respect to claim 14 to overcome Petitioner's arguments. *Id.* at 5–13.

Similarly, Petitioner relies, in part, on its claim chart mapping claims 15, 19, and 24, which depend from claim 14, to Tomioka in order to demonstrate that Tomioka discloses the additional elements of claims 28, 30, and 31, which depend from claim 26. Pet. 32–33 (citing various paragraphs from Tomioka in support of Petitioner's arguments with respect to each additional element). With the exception of claims 24 and 31, Patent Owner does not argue the patentability of any of the dependent claims separately. PO Resp. 2, 14.

2. Mapping Challenged Claim 14 onto Tomioka

As noted above, the parties focus their arguments on the recitations of independent claims 14 and 26 and, in particular, on independent claim 14. *See* Pet. 11–31; PO Resp. 2–13; Reply 2–14. Petitioner bears the burden of demonstrating that Tomioka anticipates the challenged claims. Therefore, we begin our analysis with Petitioner's mapping of the challenged claims onto Tomioka.

a. Preamble and Specific Equipment Elements

Independent claim 14 recites that "[a]n interactive television system compris[es]: a remote unit; a set-top box; and a broadcast station coupled to convey a programming signal to the set-top box." Ex. 1001, col. 14, ll. 33–37. Petitioner argues that Tomioka discloses an interactive television system. Pet. 11. In particular, Petitioner notes Tomioka's disclosures that program 38 may originate from "broadcast television, cable television, satellite television, digital television, Internet broadcasts, world wide web"; that "video, image, and/or audio information is presented to the user from the system 12 (device), such as a television set or a radio"; and that "the user *interacts* both with the system (device) 12 to view the information 10 in a desirable manner and has preferences to define which audio, image, and/or video information is obtained in accordance with the user information 14." Pet. 18–19 (quoting, e.g., Ex. 1003 ¶¶ 52, 41 (emphasis added)).[3]

Further, Petitioner argues that Tomioka discloses a "remote unit," a "set-top box," and a "broadcast station coupled to convey a programming signal to the set-top box," as recited by claim 14. *Id.* at 12; *see id.* at 19–22

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[3] Because Tomioka clearly discloses an interactive television system, it is not necessary for us to determine here whether the preamble is limiting.

(Petitioner's claim chart for claim 14). In particular, Petitioner argues that Tomioka discloses that a program displayed by its system "may originate at any suitable source, such as for example broadcast television, cable television, satellite television, digital television, Internet broadcasts, world wide web, digital video discs, still images, video cameras, laser discs, magnetic media, computer hard drive, video tape, audio tape, data services, radio broadcasts, and microwave communications." *Id.* (quoting Ex. 1003 ¶ 52). Further, Petitioner argues that Tomioka discloses that "[t]he system 16 may include *any* device(s) suitable to receive any one or more of such programs." *Id.* (quoting Ex. 1003 ¶ 52 (emphasis added)); *see* Ex. 1003, Fig. 2 (depicting system 16). In addition, Petitioner argues that Tomioka states, for example, that "the user information should be portable between and usable by different devices so that other devices may likewise be configured automatically to the user's preferences." *Id.* at 12–13 (quoting Ex. 1003 ¶ 40). Petitioner notes that Tomioka discloses examples of a "mobile terminal," including "cellular telephones, devices for receiving internet and web browsing, remote controls, portable radio devices, handheld electronic devices, networked devices, car stereos, and other appliances." *Id.* at 13; *cf.* Ex. 1001, col. 1, ll. 64–66 ("For example, the user may communicate within the system via a set-top box, cell phone, PDA, or other device."). Petitioner cites various paragraphs from Tomioka identifying these examples. Pet. 13. Upon consideration of Petitioner's evidence, we are persuaded that Tomioka discloses each of a "remote unit," a "set-top box," and a "broadcast station coupled to convey a programming signal to the set-top box," as recited in claim 14. Patent Owner does not dispute that Tomioka discloses these elements. *See* PO Resp. 5.[4]

b. "Update" Element

Independent claim 14 further recites that "the system is configured to: *update a user profile responsive to a first user activity*, the first user activity being initiated via a first device corresponding to *one of the remote unit and the set-top box*." Ex. 1001, col. 14, ll. 38–42 (emphases added). Either the remote unit or the set-top box may be used to initiate the first user activity. Petitioner argues that Tomioka discloses a "user description scheme is generated by direct user input, and by using a software that watches the user to determine his/her usage pattern and usage history" (Pet. 13 (quoting Ex. 1003 ¶¶ 62–63)) and that the user description scheme can be "updated in a dynamic fashion by the user or automatically," depending on user preferences (*id.* (citing Ex. 1003 ¶¶ 62–63, 90–91, 95, 122)). Thus, Petitioner argues that Tomioka's "user description scheme" corresponds to the "user profile" recited in claim 14. *Id.* at 17 (citing Ex. 1003 ¶ 76); *see* Tr. 9:17–22. In particular, Petitioner argues that Tomioka discloses "storing the user's usage history including facts that the user viewed and selected programs and browsing procedures thereof viewed, and utilizing a variety of algorithms, a machine may automatically prepare the user's preferences." *Id.* at 22 (quoting Ex. 1003 ¶ 90). Further, Petitioner argues that Tomioka discloses that

> the system can store the user history and create entries in the user description scheme based on the user's audio and video viewing habits. . . . [T]he user would never need to program the

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[4] Independent claim 26 does not recite these structural elements expressly. *See* Ex. 1001, col. 15, ll. 39–42; *cf. id.* at col. 16, ll. 17–20 (claim 27).

> viewing information to obtain desired information. . . . [T]he user [description][5] scheme enables modeling of the user by providing a central storage *for the user's listening, viewing, browsing preferences, and user's behavior*.

Id. at 23 (quoting Ex. 1003 ¶ 58 (emphasis added)); *see also* Ex. 1003 ¶ 58 ("The average consumer has an ever increasing number of multimedia devices, such as a home audio system, a car stereo, several home television sets, web browsers, etc."). Thus, Petitioner argues that "Tomioka discloses a 'first user activity' of ***browsing audio content*** on a 'first device' which is a 'remote unit,' a ***car audio player***." Reply 3 (citing Pet. 23 (citing Ex. 1003 ¶ 97)). Therefore, Petitioner argues that Tomioka discloses the "update" element, as recited in claim 14. *See* Reply 3–4; *see also* Tr. 9:3–4 ("Tomioka discloses the same sort of system with a common user profile across activities and devices.").

Patent Owner contends that Petitioner's citation to numerous paragraphs of Tomioka in support of Petitioner's arguments with respect to this element of claim 14 is improper. PO Resp. 5–6; *see* Pet. 22. In particular, Patent Owner contends that Petitioner's use of string citations and its reliance on the quotation of these paragraphs in its claim chart fails to identify the disclosures of Tomioka relied upon in the Petition with the necessary specificity. *Id.* at 6–7; *see id.* at 7 n.1; Tr. 48:18–25. We disagree. As noted above, we are persuaded that Petitioner has provided sufficient explanation (Pet. 13) and identified the portions of Tomioka (*id.* at

[5] Tomioka refers to the "user descriptor scheme" once and to the "descriptors" of the program description scheme and the "user description scheme." *See* Ex. 1003 ¶ 58. For the sake of consistency and clarity, we refer only to the "user description scheme."

22–24), upon which it relies, with sufficient specificity for us to understand and evaluate Petitioner's arguments.[6]

For the reasons explained by Petitioner, we are persuaded that Tomioka discloses updating a user profile responsive to a first user activity, as recited in claim 14. Further, we are persuaded that Tomioka discloses that this first user activity may be initiated via a first device that may correspond to either a remote unit or to a set-top box, "such as a personal video recorder, a TiVo player, a RePlay Networks player, a car audio player, *or other audio and/or video appliance*." *See id.* at 23 (quoting Ex. 1003 ¶ 97 (emphasis added)).

c. "Detect" Element

Independent claim 14 further recites that "the system is configured to: . . . *detect a second user activity,* the second user activity being initiated via a second device corresponding to one of the remote unit and the set-top box, *the second device being different from the first device*." Ex. 1001, col. 14, ll. 43–46 (emphases added). Claim 14 also recites that one of the first user activity, referenced in the preceding element, and the second user activity, referenced in this element, is "related to television viewing"; and the other is "unrelated to television viewing." *Id.* at col. 14, ll. 47–52. Petitioner argues

[6] Patent Owner contends that Petitioner's arguments with respect to other elements of claim 14 are deficient for substantially the same reasons. PO Resp. 8 ("For this requirement, the Petition provides a claim chart block quoting and string citing *twelve* paragraphs and *three* figures of Tomioka."), 9 ("For this requirement, the Petition provides a claim chart block quoting and string citing *fourteen* paragraphs and *four* figures of Tomioka."), 10 ("For this requirement, the Petition provides a claim chart block quoting and string citing *nine* paragraphs and *two* figures of Tomioka."). For the reasons noted above, we find Patent Owner's contentions unpersuasive with respect to those elements. *See* Reply 1, 4–5; Tr. 54:16–56:10.

that Tomioka discloses that "[v]ideo, image, or audio information may be presented to the user using a device *such as a television or radio*." Pet. 14 (quoting Ex. 1003 ¶ 42); *see id.* at 24 (Petitioner's claim chart for claim 14); *see also* Ex. 1003 ¶ 41, Figs. 1, 2 (depicting the video, image, and/or audio information (program) provided or otherwise made available to a user and/or a system); *cf.* Ex. 1001, Figs. 1, 2 (depicting information provided by satellite based system 23, cable based system 24, and terrestrial or multiple multi-point distribution service based system 25 and/or remote source 13). Petitioner argues that Tomioka further discloses that three components of its system: program 10, user 14, and system 12, interact to create information "that can be used in enabling browsing, filtering, searching, archiving, and *personalization*." Ex. 1003 ¶ 42 (emphasis added). Specifically, preferences are created "to define which audio, image, and/or video information is obtained in accordance with the user information." Pet. 14 (quoting Ex. 1003 ¶ 41).

In addition, Petitioner argues that Tomioka discloses creation of its user description scheme based on a user's various activities whether "related to television viewing" or "unrelated to television viewing," as recited by claim 14. *Id.* at 15; *see id.* at 24–26 (Petitioner's claim chart for claim 14). In particular, Petitioner argues that Tomioka discloses receiving programming from various sources, including television, Internet broadcasts, the world-wide-web, tape, data services, and radio broadcasts. *Id.* at 15 (citing Ex. 1003 ¶ 52); *see also* Ex. 1003, Fig. 2 (referring to audio visual programs and data and services). For example, Petitioner argues that Tomioka discloses that "a user may watch basketball games, review 'web-based textual information' regarding particular basketball games, and 'read the news.'" Pet. 15 (citing Ex. 1003 ¶ 57). Thus, a person of ordinary skill in the art would understand that at least "read[ing] the news" is an activity "unrelated to television viewing." Ex. 1016 ¶ 73; *see Preda*, 401 F.2d at 826.

For the reasons explained by Petitioner, we are persuaded that Tomioka discloses detecting a second user activity, such as on a device different from that used with respect to the first activity, as recited in claim 14. Further, either the first or the second user activity is an activity "unrelated to television viewing," and the other activity is an activity "related to television viewing."

d. "Access" Element

Independent claim 14 further recites that "the system is configured to: . . . access the user profile *in response to the second user activity*." Ex. 1001, col. 14, ll. 53–54 (emphasis added). Petitioner argues that Tomioka discloses *accessing* the user description scheme to deliver *personalized* content to the user on multiple devices. Pet. 14; *see id.* at 26 (Petitioner's claim chart for claim 14). For example, Petitioner argues that Tomioka discloses that "the user information should be portable between and usable by different devices *so that other devices may likewise be configured automatically to the particular user's preferences upon receiving the viewing information*." *See id.* (quoting Ex. 1003 ¶ 40 (emphasis added)). In particular, the "user [description] scheme enables modeling of the user by providing a central storage for the user's listening, viewing, browsing preferences, and user's behavior" and this "enables devices to be quickly personalized, and enables other components, such as intelligent agents, to communicate on the basis of a standardized description format, and to make smart inferences regarding the user's preferences." *Id.* (quoting Ex. 1003 ¶ 58). Petitioner argues that "such devices 'access content from different sources' including the 'web, terrestrial or cable broadcast,' and 'access multiple or different types of media.'" *Id.* at 15 (quoting Ex. 1003 ¶ 60).

As recited in claim 14, the accessing of the user profile is "in response to the second user activity." As recited in the "detect" element, the *second* user activity may be related or unrelated to television viewing and must be from a device different from that used in the *first* user activity. Petitioner argues that the user description scheme provides "central storage for the user's *listening, viewing, browsing* preferences, and user's behavior" to enable devices to be personalized and share information. *Id.* (quoting Ex. 1003 ¶ 58 (emphasis added)); *see* Tr. 15:9–16:24. Thus, a person of ordinary skill in the art would understand that "listening, viewing, [and] browsing preferences" disclose activities on different devices and, consequently, accessing those preferences on different devices. Pet. 15–18, 26 (citing Ex. 1003 ¶¶ 60, 63); *see* Ex. 1016 ¶¶ 70–72.

For the reasons explained by Petitioner, we are persuaded that Tomioka discloses accessing the user profile in response to the second user activity, as recited in claim 14. Further, the second user activity is an activity related to or unrelated to television viewing.

e. "Transmit" Element

Independent claim 14 further recites that "the system is configured to: . . . transmit data responsive to the second user activity, *wherein the transmitted data is based at least in part on the user profile*, and *wherein the first user activity affects a content of said data transmitted to the user responsive to the second user activity*." Ex. 1001, col. 14, ll. 55–59 (emphases added). Petitioner argues that Tomioka discloses that the system "records and presents to the user *audio and video information* based upon the user's prior viewing and listening habits, preferences, and personal characteristics, generally referred to as user information." Pet. 14–15 (quoting Ex. 1003 ¶ 40 (emphasis added)); *see id.* at 26–28 (Petitioner's claim chart for claim 14). Specifically, Petitioner argues that Tomioka discloses an "'intelligent software agent' [that] tracks user preferences (indicated by their activities) and uses those preferences to distribute user-targeted content." Reply 13 (citing Ex. 1003 ¶ 93). Moreover, Petitioner argues that Tomioka discloses that this agent can "consult with the user description scheme and obtain information that it needs for acting on behalf of the user" and that the system can "discover programs that fit the taste of the user, alert the user about such programs, and/or record them autonomously." Pet. 15 (quoting Ex. 1003 ¶ 63); *see also* Reply 13 ("Specifically, '[t]he data may be used for any purpose, such as for example, providing targeted advertising or programing on the device ***based on*** such data.'"; quoting Ex. 1003 ¶ 93 (emphasis added by Petitioner)). Thus, Petitioner argues that Tomioka discloses that information from various devices may be combined in a user description scheme to tailor the programming subsequently provided to users on those devices.

Patent Owner contends that "recording, presenting, and discovering differ from a singular claim requirement of 'transmitting.' And the claim also requires that the transmission be effected *responsive* to the second user activity." PO Resp. 12 (emphasis added). We disagree. For the reasons noted above, we determine that Tomioka discloses that, "since the machine contains the user's viewing history informations and user's preference informations . . . the following program or content *may be automatically provided to the user for viewing*, and a new program may be recommended based on the preference information." Pet. 27 (quoting Ex. 1003 ¶ 92); Reply 10. Further, Tomioka discloses that its system "records and ***presents*** to the user audio and video information based upon the user's prior viewing and listening habits, preferences, and personal characteristics, generally referred to as user information." Reply 10 (quoting Ex. 1003 ¶ 40 (emphasis added by Petitioner)); *see* Tr. 9:23–12:10. "Additionally, Tomioka explicitly discloses that 'the user preferences may be stored in a server and the content adaptation can be performed according to user descriptions at the server and then the preferred content is ***transmitted*** to the user.'" *Id.* (quoting Ex. 1003 ¶ 104 (emphasis added by Petitioner)). Because the user preferences are the result of the user's activities on all of the various devices linked to Tomioka's system, we are persuaded that Tomioka discloses that information is transmitted based at least in part on the user description scheme and that user activity on a first device affects a content of the information transmitted to the user responsive to user activity on a second device. *See* Pet. 27 (citing Ex. 1003 ¶¶ 63, 93); Reply 11.

Thus, we are persuaded that Tomioka discloses transmitting data or information responsive to the second user activity, as recited in claim 14. Further, the data transmitted is based at least in part on the user profile or user description scheme, and the first user activity on a first device affects a content of the data or information transmitted to the user responsive to the user activity on a second device.

f. Single Embodiment

In order for Tomioka to anticipate claim 14, each and every element of claim 14 must be found within the four corners of Tomioka and all of the elements must be "arranged or combined in the same way as recited in the claim." *Net MoneyIN*, 545 F.3d at 1371. Patent Owner contends that

> the Petition never points to any embodiment disclosing using both activities "related to television viewing" and "unrelated to television viewing" with regard to the user profile. Instead of identifying a single embodiment disclosing ***both*** activities, the linchpin of Petitioner's argument is the empty assertion that "Tomioka discloses description schemes that may be used across such services. Id. ¶ 0065."

PO Resp. 9; *see* Tr. 7:2–5.

We addressed this requirement in our Decision to Institute. Dec. 11–12. Specifically, we noted that we read Figures 22–27 and the accompanying text to describe variations of the embodiment of Figure 1, rather than alternative embodiments. *Id.*; *see* Tr. 18:4–19:22. Petitioner has asserted that its arguments rely on a single embodiment of Tomioka. Reply 1, 8–9. Patent Owner does not point to anything in the disclosure of Tomioka that demonstrates that the paragraphs relied upon by Petitioner describe separate and unrelated embodiments. PO Resp. 9. As discussed above, Tomioka's Figures 1 and 22 are directed to the same user preference description scheme 20; and Petitioner's mapped citations relate to this common embodiment. Pet. 18–31, Reply 1, 8; *see* Tr. 18:18–19:22 (citing *Kennametal, Inc. v. Ingersoll Cutting Tool Co.*, 780 F.3d 1376, 1381 (Fed. Cir. 2015) ("[A] reference can anticipate a claim even if it 'd[oes] not expressly spell out' all the limitations arranged or combined as in the claim, if a person of skill in the art, reading the reference, would 'at once envisage' the claimed arrangement or combination.")); *Nelson Products, Inc. v. Bal Seal Engineering, Inc.*, Case IPR2014-00572, slip op. 22 (PTAB Sept. 24,

2015) (Paper 55). Based on this record, we remain persuaded that the cited disclosures of Tomioka relate to a single embodiment.

Therefore, Petitioner has demonstrated by a preponderance of the evidence that Tomioka anticipates independent claim 14.

3. Independent Claim 26 and Dependent Claims 15, 16, 19, 21, 28, and 30

As noted above, although Petitioner maps each element of challenged claims 15, 16, 19, 21, 26, 28, and 30 onto Tomioka (Pet. 17–18, 28–33), Patent Owner limits its response to Petitioner's anticipation arguments to independent claim 14 (PO Resp. 2). Patent Owner contends, however, that "[c]laims 14 and 26 differ in scope but require similar functionality." PO Resp. 2; *see* Dec. 9–10 ("Petitioner relies largely on its claim chart with respect to claim 14 to demonstrate that Tomioka discloses each and every element of claim 26."). Nevertheless, as we noted in the Decision to Institute, Petitioner acknowledges that claim 26 recites program instructions stored on a computer readable medium, rather than system components, as recited in claim 14. Dec. 9 (citing Pet. 32). Given the near identical language of claims 14 and 26 used to recite the instructions performed by the system (claim 14) and stored on the computer readable storage medium (claim 26), we agree with Petitioner that the mapping of challenged claim 14 onto Tomioka is equally applicable to challenged claim 26. Pet. 31–32; Reply 2–3; *see* Ex. 1003 ¶¶ 52–55 (describing Tomioka's use of a storage unit or storage device in its system), Fig. 2 (depicting Data Storage Unit 50 of System 16); Ex. 1016 ¶ 95. Therefore, on this record, we are persuaded that Petitioner has demonstrated by a preponderance of the evidence that Tomioka anticipates independent claim 26.

Patent Owner does not contest separately Petitioner's mapping of the additional elements recited in dependent claims 15, 16, 19, 21, 28, and 30 onto Tomioka. *See* PO Resp. 2, 13. Further, as noted in our Decision to Institute,

> [c]laim 21 depends from claim 14 via intervening claim 20, and claim 28 depends from claim 26 via intervening claim 27. Petitioner does not challenge claim 20 or 27 expressly. *See* Pet. 30, 53–54. Nevertheless, because we institute on the asserted ground of anticipation by Tomioka, we consider the limitations of claims 20 and 27 in our evaluation of claims 21 and 28, respectively.

Dec. 5 n.2. Claims 20 and 27 merely *specify* that the first user activity is performed via a set-top box and that the second user activity is performed via a remote unit. Ex. 1001, col. 15, ll. 16–20 (claim 20), col. 6, ll. 17–20 (claim 27). These specific recitations are encompassed within the recitations of claims 14 and 26, respectively (*id.* at col. 14, ll. 47–52 (claim 14), col. 16, ll. 4–9 (claim 26)); and Petitioner has demonstrated that this specific configuration is disclosed by Tomioka (Pet. 18–21, 32). Having weighed the evidence presented by Petitioner regarding the mapping of the elements of these dependent claims onto Tomioka (*see* Pet. 17–18, 28–30, 32–33; Ex. 1016 ¶¶ 80–88, 90, 98–100) and in the absence of any arguments by Patent Owner directed specifically to claims 15, 16, 19–21, 27, 28, and 30 (Paper 11, 3), we are persuaded that Petitioner has demonstrated by a preponderance of the evidence that Tomioka anticipates each of dependent claims 15, 16, 19, 21, 28, and 30.

For the reasons set forth above and on this record, Petitioner has established by a preponderance of the evidence that claims 14–16, 19, 21, 26, 28, and 30 of the ’229 patent are anticipated by Tomioka.

4. Dependent Claims 24 and 31

Claims 24 and 31 depend from independent claims 14 and 26, respectively. Claim 24 recites that "the system is further configured to update the user profile in response to *detecting* a physical location of a user's location trackable mobile unit" (Ex. 1001, col. 15, ll. 32–35 (emphasis added)) and claim 31 recites that "the program instructions are executable to select the data to be transmitted at least in part on the *detected* physical location of the second device" (*id.* at col. 16, ll. 37–40 (emphasis added)). With respect to claim 24, Petitioner argues that Tomioka discloses the use of mobile terminals and cellular telephones, which allegedly "were well-known to have location tracking *capabilities*." Pet. 18 (emphasis added) (citing Ex. 1016 ¶¶ 91–95); *see* Ex. 1003 ¶¶ 46 (describing "a handheld electronic device"), 91 (describing "a mobile terminal"), 106 (describing "a cellular telephone"). With respect to claim 31, Petitioner refers to its discussion of claim 24, and argues that "Tomioka discloses that a user can specify different preferences based on 'different locations' and these may become part of the user references that determine the data that will be sent to the user." Pet. 33.

Patent Owner contends that, even if mobile terminals and cellular telephones were capable of being tracked, Petitioner fails to demonstrate that Tomioka discloses *detecting* the location of the user's mobile unit and *updating* the user profile in response to the detected location of the user's mobile unit, as recited in claim 24, or *transmitting* data to the user's mobile unit based in part on the detected location of the user's mobile unit, as recited in claim 31. PO Resp. 14. Patent Owner also contends that, even assuming that the physical location of Tomioka's mobile terminals and cellular telephones *could* be detected and that their locations then *could* be used for updating the user profile or for transmitting data, that would be an obviousness-type assertion, not an anticipation argument. *Id.*

Petitioner disagrees (Reply 15), but Petitioner fails to identify where Tomioka discloses *detecting* a mobile device's location. Petitioner only provides the unsupported assertion that "[t]he user's location [in Tomioka] is determined using the location of the cellular telephone, which is calculated with the cellular telephone's GPS unit and is stored in the user description scheme, as described above." *Id.* at 16. During the hearing, we asked Petitioner specifically: "where does Tomioka teach detecting as opposed to receiving from the user's device a physical location?" Tr. 20:10–12. Petitioner again argued that a person of ordinary skill in the art would understand that Tomioka's mobile devices, including cellular telephones, "were known to be -- have *detectable* locations or location *trackability*." *Id*. at 20:15–19 (emphases added). This, however, merely describes a capability, not an action. We are not persuaded that Petitioner has shown that Tomioka expressly discloses *detecting* the location of the user's unit or device, as recited in both claims 24 and 31.

Further, during the hearing, Petitioner argued for the first time that Tomioka *inherently* discloses the detecting of the location of the user's mobile device. *Id.* at 25:7– 26:7. Nevertheless, it is too late to present such an argument at the hearing. *See Dell, Inc. v. Acceleron, LLC*, 818 F.3d 1293, 1301 (Fed. Cir. 2016) ("In this case, the Board denied Acceleron its procedural rights by relying in its decision on a factual assertion introduced into the proceeding only at oral argument, after Acceleron could meaningfully respond.").

On this record, we are not persuaded that Petitioner has demonstrated by a preponderance of the evidence that claims 24 and 31 are anticipated by Tomioka.

III. CONCLUSION

For the reasons set forth above and on this record, we are persuaded that Petitioner has demonstrated by a preponderance of the evidence that claims 14–16, 19, 21, 26, 28, and 30 of the ’229 patent are anticipated by Tomioka. Nevertheless, for the reasons set forth above and on this record, we are not persuaded that Petitioner has demonstrated by a preponderance of the evidence that claims 24 and 31 of the ’229 patent are anticipated by Tomioka.

IV. ORDER

For the reasons given, it is

ORDERED that claims 14–16, 19, 21, 26, 28, and 30 of the ’229 patent are unpatentable under 35 U.S.C. § 102(a) as anticipated by Tomioka;

FURTHER ORDERED that claims 24 and 31 of the ’229 patent are not unpatentable under 35 U.S.C. § 102(a) as anticipated by Tomioka; and

FURTHER ORDERED that, because this is a Final Written Decision, the parties to this proceeding seeking judicial review of our decision must comply with the notice and service requirements of 37 C.F.R. § 90.2.

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US007900229B2

(12) **United States Patent**
Dureau

(10) **Patent No.: US 7,900,229 B2**
(45) **Date of Patent: Mar. 1, 2011**

(54) **CONVERGENCE OF INTERACTIVE TELEVISION AND WIRELESS TECHNOLOGIES**

(75) Inventor: **Vincent Dureau**, Palo Alto, CA (US)

(73) Assignee: **OPENTV, Inc.**, San Francisco, CA (US)

(*) Notice: Subject to any disclaimer, the term of this patent is extended or adjusted under 35 U.S.C. 154(b) by 947 days.

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(58) **Field of Classification Search** 725/46, 725/9–25; 705/14
See application file for complete search history.

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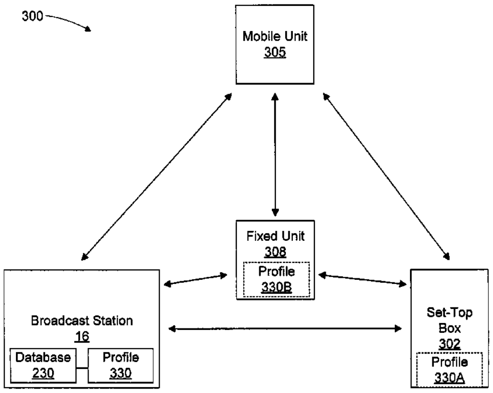
(57) **ABSTRACT**

A system and method for utilizing user profiles in an interactive television system. An interactive television system includes a broadcast station, a set-top box, and a remote mobile or fixed unit. The system is configured to create and/or update a user profile in response to an access made in a first access mode. In response to detecting a user access in a second access mode, the system accesses the user profile, selects data based at least in part on the user profile, and transmits the data to the user.

32 Claims, 6 Drawing Sheets



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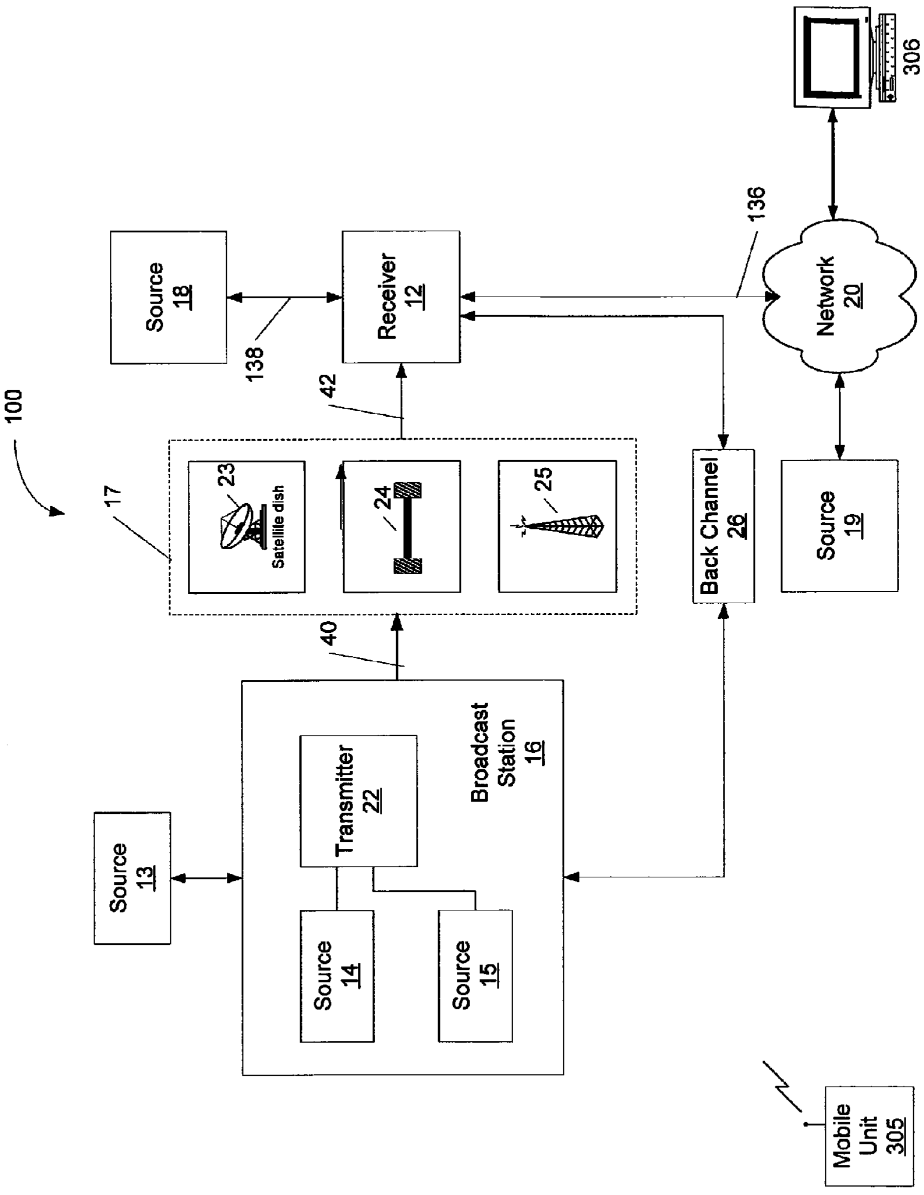
100
Source 18
138
Receiver 12
42
136
Network 20
306
17
Satellite dish
23
24
25
Back Channel 26
Source 19
40
Broadcast Station 16
Transmitter 22
Source 13
Source 14
Source 15
Mobile Unit 305

Fig. 1

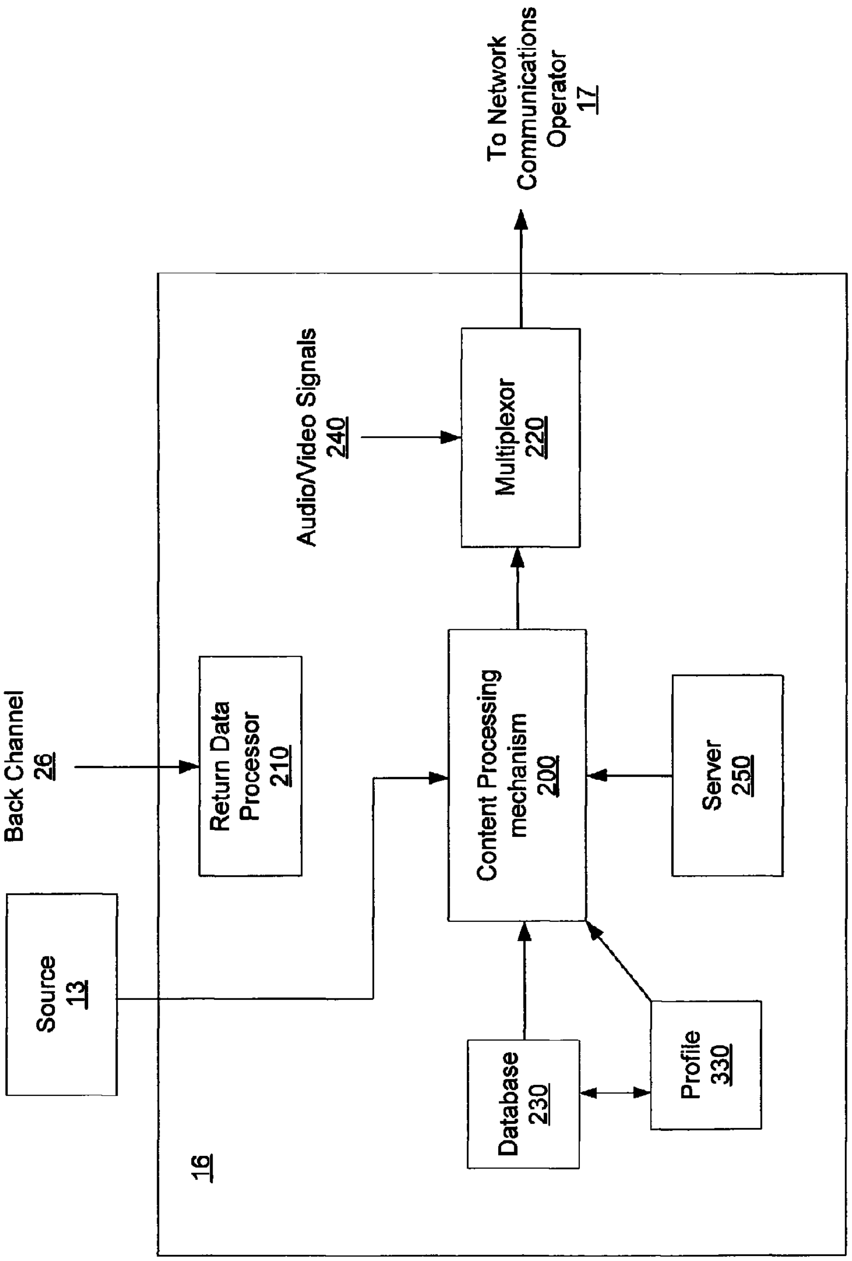
To Network Communications Operator 17
Audio/Video Signals 240
Multiplexor 220
Back Channel 26
Return Data Processor 210
Content Processing mechanism 200
Server 250
Source 13
Database 230
Profile 330
16

Fig. 2

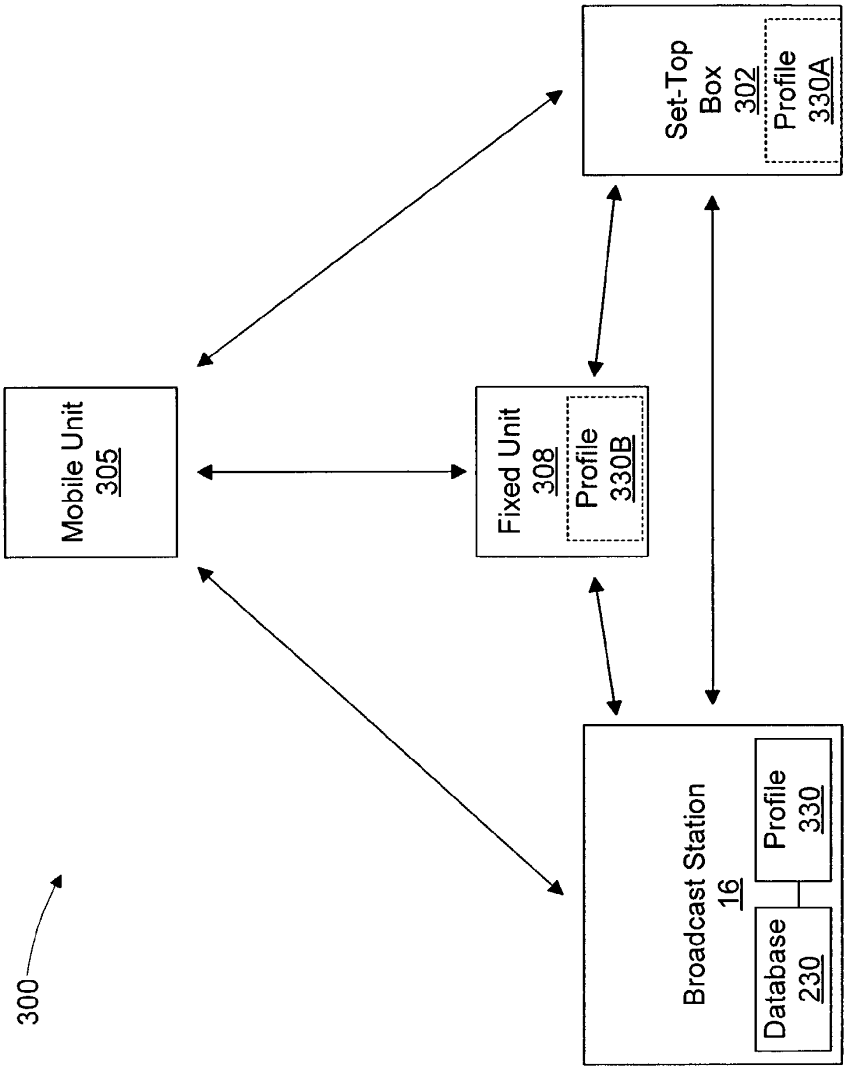
Set-Top
Box
302
Profile
330A
Mobile Unit
305
Fixed Unit
308
Profile
330B
Broadcast Station
16
Profile
330
Database
230
300

Fig. 3

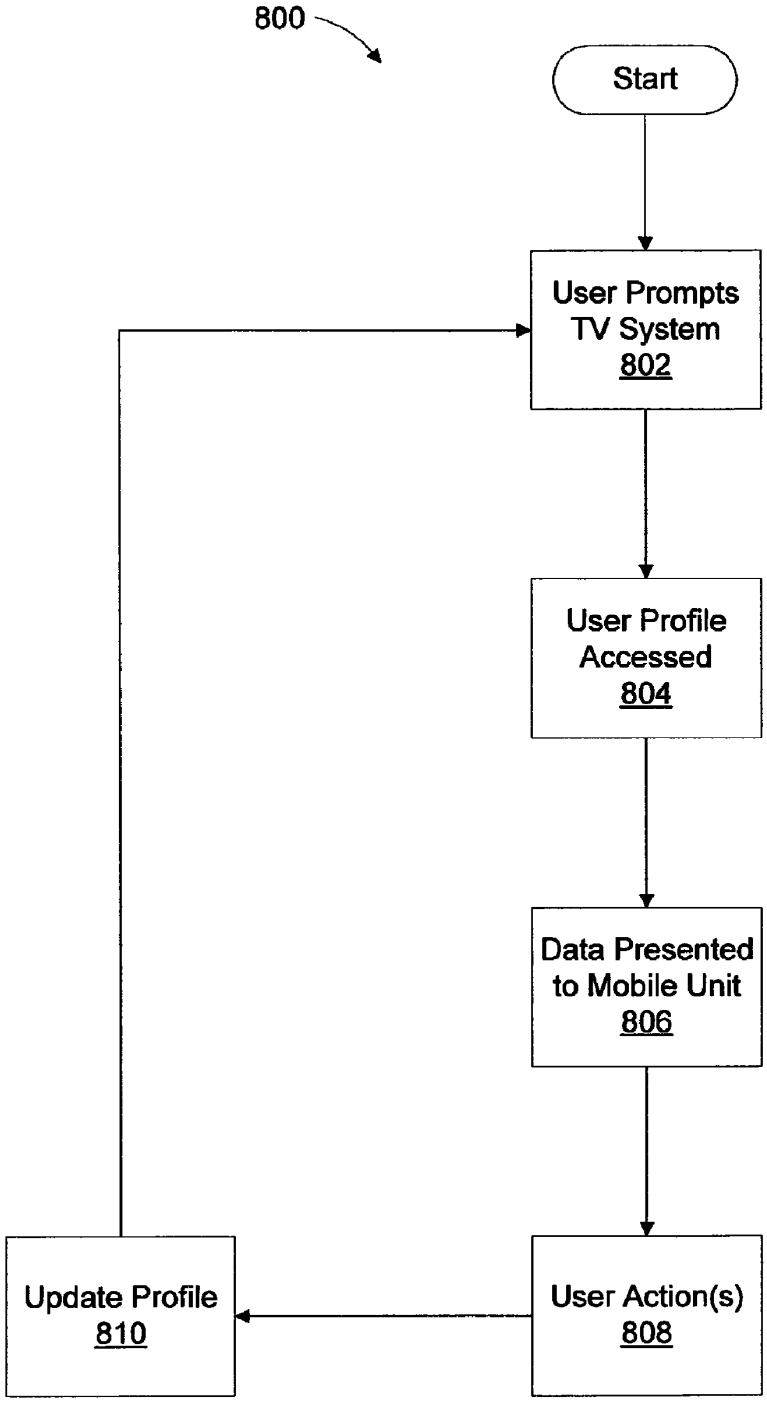
800
Start
User Prompts TV System 802
User Profile Accessed 804
Data Presented to Mobile Unit 806
User Action(s) 808
Update Profile 810

Fig. 4

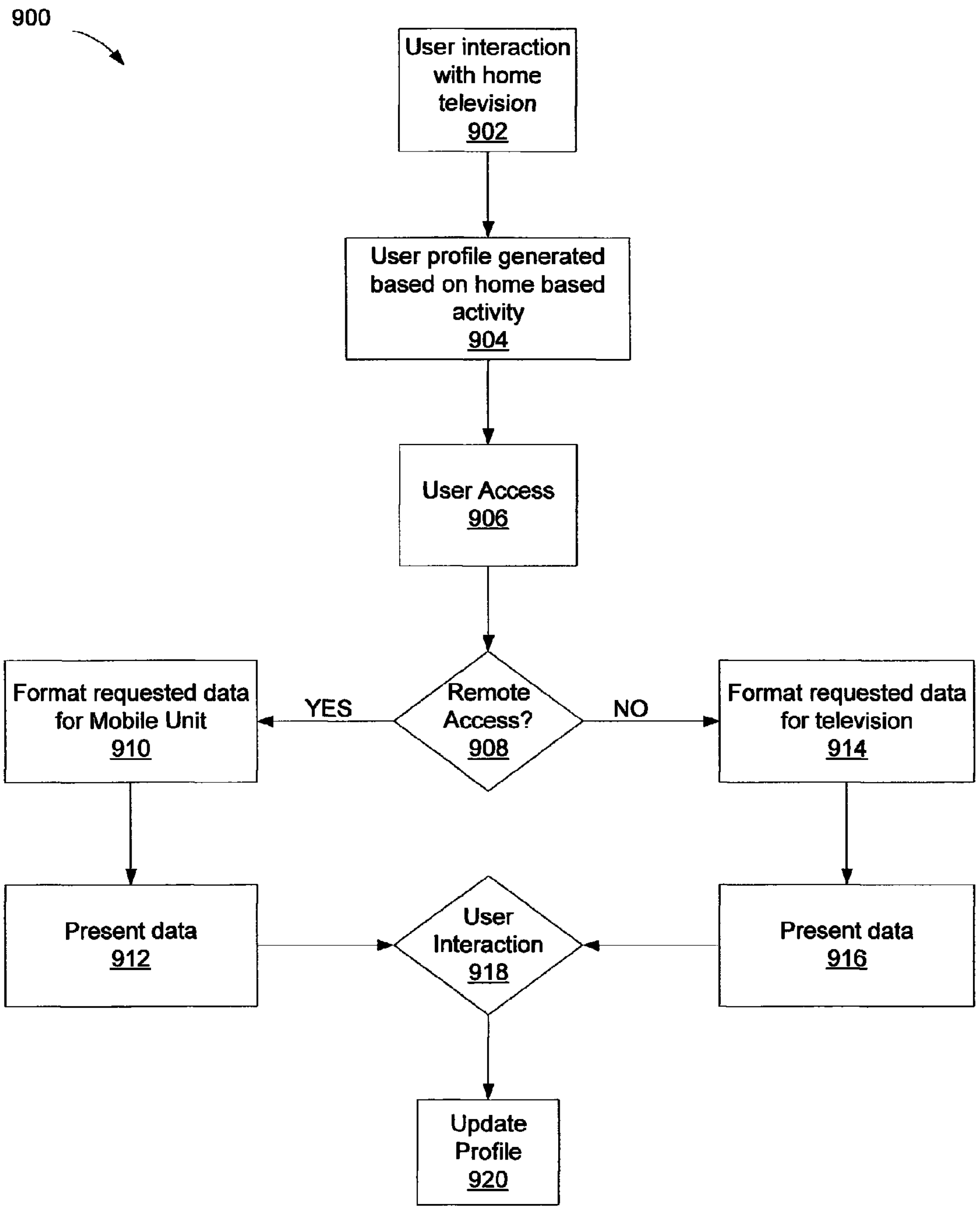
900
User interaction with home television 902
User profile generated based on home based activity 904
User Access 906
Remote Access? 908
YES
NO
Format requested data for Mobile Unit 910
Format requested data for television 914
Present data 912
Present data 916
User Interaction 918
Update Profile 920

Fig. 5

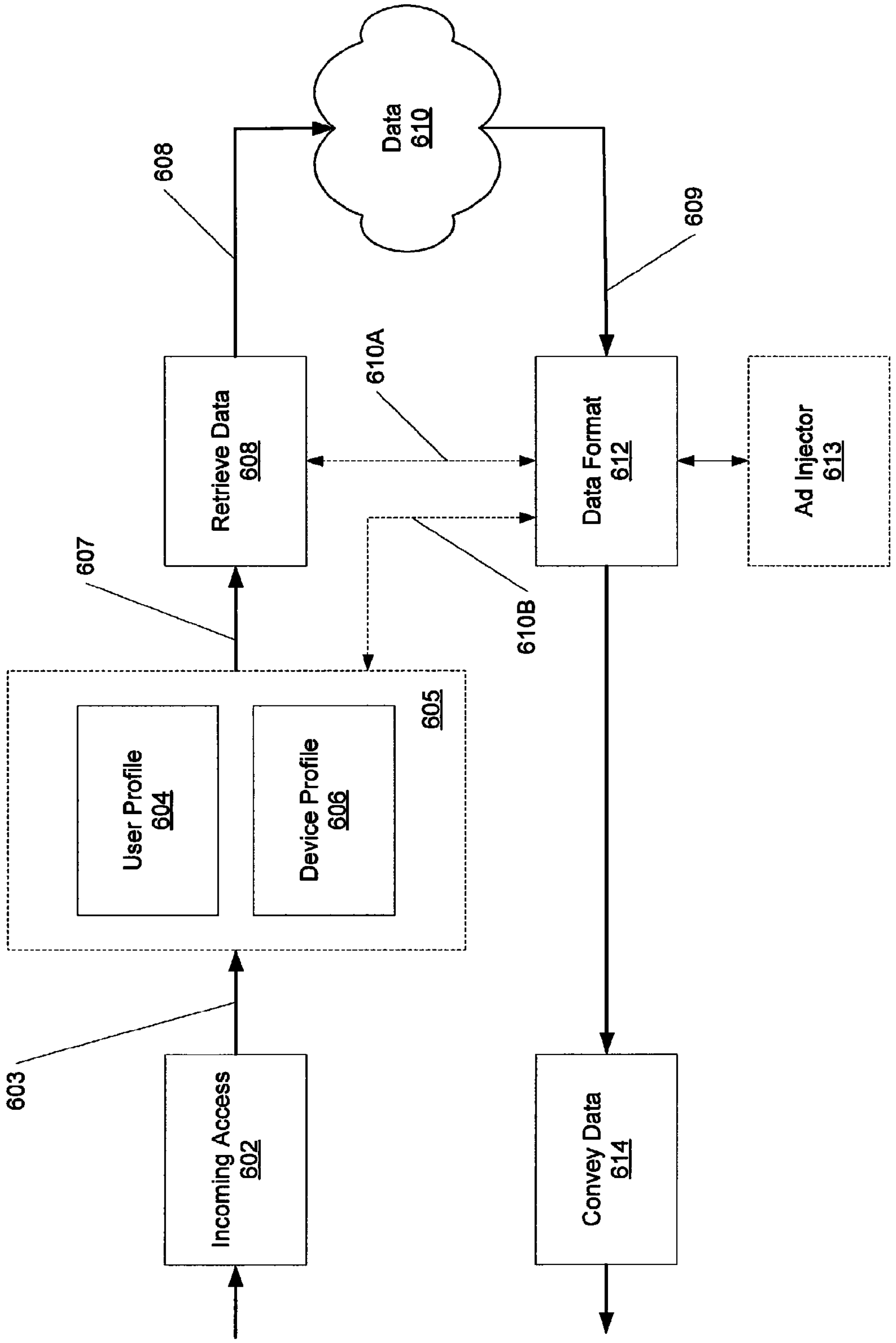
Data
610
608
609
Retrieve Data
608
610A
Data Format
612
Ad Injector
613
607
610B
605
User Profile
604
Device Profile
606
603
Incoming Access
602
Convey Data
614

Fig. 6

CONVERGENCE OF INTERACTIVE TELEVISION AND WIRELESS TECHNOLOGIES

BACKGROUND OF THE INVENTION

1. Field of the Invention

This invention relates to interactive television, and more particularly, the convergence of interactive television and wireless technologies in networks based on interactive television.

2. Description of the Related Art

Television service providers, such as a satellite broadcaster or a cable multiple system operator (MSO), transmit audio-video streams to a viewer's television system. The viewer's television system frequently consists of a set-top box connected to a television set and a recording device, but may consist of any number of suitable devices. In addition to the audio and video that viewers typically think of as television programs, television service providers may transmit additional information as well. For example, the additional information may be instructions which are interpreted by an interpreter or virtual machine. Alternatively, a service provider may transmit HTML data for rendering by a presentation engine. If the broadcast is analog, this additional information may be encoded in the VBI (vertical blanking interval). If the broadcast is digital, additional information may be multiplexed with the audio and video according to a standard format, such as MPEG-2, or a proprietary format.

Interactive television systems provide a means to deliver interactive content as well as ordinary television audio and video to a large number of subscribers. Programs broadcast by these systems may incorporate television audio and video, still images, text, interactive graphics and applications, and many other components. The interactive content of the interactive television signal may therefore include application code, data associated with the audio and video, control signals, raw data and many other types of information. Both the interactive content and the audio and video data may be delivered to subscribers as "pushed" data. That is, the data is delivered to each of the subscribers, regardless of whether or not the subscribers requested the data.

As interactive television technology advances, it is possible to provide more personalized services to individual users. For example, it may be possible for a interactive television user to schedule the recording of various television programs well in advance of their broadcasting, as well as scheduling specific times for their playback. Furthermore, it may be possible for a user to receive notifications for upcoming programs that are of similar content to those that have been recorded in the past.

Although interactive television may provide a number of services, such as those noted above, additional capabilities may be possible using existing interactive television technologies, or by combining other technologies with interactive television.

SUMMARY OF THE INVENTION

A system and method combining wireless and interactive television technologies is disclosed. In one embodiment, an interactive television system includes a broadcast station, a set-top box, and a remote unit. Generally speaking, a user may access the system through various means. For example, the user may communicate within the system via a set-top box, cell phone, PDA, or other device. The system is configured to creating and maintain a user profile which reflects activity of the user within the system. Activity performed in a first mode, such as television viewing, may cause the creation and/or updating of a user profile which reflects the user's viewing activities. Similarly, cell phone or other mobile unit activities and communications may cause the creation and/or updating of an already existing user profile. Information which is conveyed to a user is based at least in part on the data in the user profile. Accordingly, in one embodiment, a user's cell phone activity may affect the information the user receives at home on their television, and vice versa.

The mobile unit may be one of several different types of devices. In one embodiment, the mobile unit may be a cellular telephone. In other embodiments, the mobile unit may be a personal digital assistant (PDA), a smart remote control or a portable computer system. The mobile unit may be configured for wireless communications with both the set-top box, broadcast station, other mobile devices, or any other device configured to communicate within or through the television system. The mobile unit may send data to either the broadcast station or the set-top box. Similarly, the mobile unit may receive data from the broadcast station or the set-top box. Intermediate communications may be possible as well. For example, data may be transmitted from the broadcast station to the set-top box via the internet before being transmitted to the mobile unit. Similarly, it may be possible for data to be transmitted from the mobile unit, to the set-top box, and then to the broadcast station.

In some embodiments, a fixed unit may also be present. For example, in one embodiment, a fixed unit such as a personal computer may be incorporated and utilized in the system. The system user may also be able to connect to and utilize other functions of the system (provided by the mobile unit, broadcast station, and set-top box) through an internet connection or a combination of internet and wireless communications.

The presentation of data at the mobile unit may vary depending upon the particular embodiment. In some embodiments, the mobile unit may include technology to indicate its physical location, and thus the location of the user. In one embodiment, global positioning system (GPS) technology may be present in the mobile unit. In another embodiment, the physical location of the mobile unit may be determined by triangulation, such as triangulating from multiple cell phone antenna towers.

The broadcast station may be a station where programming and content are broadcast to a number of users. The broadcast station may include a database in which user profiles are stored for each individual user. Data may be received by the broadcast station from either the set-top box (e.g. in a "store and forward" mode) or directly from the mobile unit itself. Similarly, the broadcast station may send data to the set-top box or to the mobile unit directly. The broadcast station may transmit both normal television (i.e. non-interactive) programming, as well as interactive television programming and other content. Content may be "pushed" to the mobile unit (i.e. sent without a user request) or "pulled" (sent to the mobile unit based on a user request or other action). It should be further noted that the set-top box may be configured to store a user profile for its associated user.

The user profile may include basic user information, various user preferences, and other information. The information in the user profile may be compiled from various user actions, such as programs watched, channels watched, or other content accessed. The user may also input information into the user profile. Such information may include credit card numbers, frequent flier memberships, preferences, and virtually any other information that may define the user. This information may be combined with other user information in the user profile in order to determine content that is to be sent to the set-top box and/or the mobile unit.

BRIEF DESCRIPTION OF THE DRAWINGS

Other aspects of the invention will become apparent upon reading the following detailed description and upon reference to the accompanying drawings in which:

FIG. **1** is a block diagram of one embodiment of a television system;

FIG. **2** is a block diagram of one embodiment of a broadcast station;

FIG. **3** is a block diagram of one embodiment of a communications network comprising a broadcast station, a set-top box, and a mobile unit;

FIG. **4** is a flow diagram illustrating one embodiment of the updating of a user profile based on actions taken with a mobile unit;

FIG. **5** is a flow diagram illustrating one embodiment of a method for interacting with the system of FIG. **1**.

FIG. **6** illustrates one embodiment of a system for using user profiles.

While the invention is susceptible to various modifications and alternative forms, specific embodiments thereof are shown by way of example in the drawings and will herein be described in detail. It should be understood, however, that the drawings and description thereto are not intended to limit the invention to the particular form disclosed, but, on the contrary, the invention is to cover all modifications, equivalents, and alternatives falling with the spirit and scope of the present invention as defined by the appended claims.

DETAILED DESCRIPTION OF THE INVENTION

Referring to FIG. **1**, one embodiment of a television system **100** is shown. In the embodiment shown, a receiving device **12** is coupled to several sources of programming and/or interactive content. Receiving device **12** may include any number of suitable devices, examples of such devices include a set-top box (STB), a television (TV), a video cassette recorder (VCR), a personal video recorder (PVR), a personal digital assistant (PDA), a personal computer (PC), a video game console, or a mobile/cell phone.

Included in the embodiment of FIG. **1**, a broadcast station **16** is coupled to a receiving device **12** via a transmission medium **17** and back channel **26**. In addition, receiving device **12** is coupled to a source **18** and source **19** via network **20**. In one embodiment, receiving device **12** may include a database configured to store user profiles. User profiles may also be located at a headend or other location within the system. In some embodiments, user profile data may be stored in more than one location Further, broadcast station **16** is coupled to a remote source **13**. In the embodiment shown, broadcast station **16** includes sources **14** and **15** and transmitter **22**. Transmission medium **17** may comprise a satellite based system **23**, a cable based system **24**, a terrestrial or multiple multi-point distribution service (MMDS) based system **25**, a combination of these systems, or some other appropriate system of transmission. A personal computer **306** may also be configured to communicate within the system **100**. In one embodiment, network **20** may comprise the Internet and the personal computer **306** may be configured to access Internet sites as well as communicate with the broadcast station **16**, receiver **12**, and other devices in the system. Also illustrated is a mobile unit **305** which may be configured for wireless communications with television system **100** in a number of different ways. For example, mobile unit **305** may be configured to communicate with broadcast station **16** through transmission medium **17**, through a wireless phone network, through a wireless internet network, or otherwise.

In the embodiment of FIG. **1**, broadcast station **16** may include a variety of sources **14** and **15** of content to be utilized and conveyed by transmitter **22**. Content sources **14** and **15** may include databases, application servers, other audio/video sources, or other data sources. In one embodiment, content may be created at a source **14** which may include an authoring station configured to create such content. An authoring station may include a computer workstation configured with software which aids in the development of interactive content. An authoring station may be part of broadcast station **16** in which case the conveyance of the created content may be through a local computing network, or similar configuration. Alternatively, an authoring station may be remotely located **13** from broadcast station **16**. In an embodiment where authoring station is not directly coupled to broadcast station **16**, the content created by a source **13** may be conveyed to broadcast station **16** via Internet, broadcast, cable, etc. In some cases, content created at a remote location **13** may first be transferred to a storage medium, such as a CD-ROM or DVD-ROM, and transported to broadcast station **16** via more conventional means where it may be stored in a database or other storage device.

Subsequent to its creation, content from sources **13**, **14** and **15** may be delivered to client **12** through a broadcast transmission network. This network consists essentially of a broadcast station **16** which assembles the content from sources **13**, **14** and **15** and processes (e.g., digitizes, compresses and packetizes) the content, and a transmission network **17** which receives the content **40** from broadcast station **16** and conveys it **42** to client **12**. (It should be noted that client **12** may be only one of many devices to which this content is distributed.) In one embodiment, broadcast station **16** includes software and/or hardware which is configured to process the content conveyed by sources **13**, **14** and **15** as described above. A second delivery mechanism may include a direct point-to-point connection **138** between client **12** and source **18** which may be some type of server. This connection **138** may be made via an ordinary telephone line, cable, wireless, or otherwise. A third delivery mechanism may also be a point-to-point connection **136**, but transmission of the content from a source **19** to client **12** is made via one or more shared networks (e.g., over the Internet). Also illustrated in FIG. **1** is a back channel (or return path) **26** by which client **12** may convey to and/or receive data from broadcast station **16**. Back channel **26** may comprise a telephone line, cable, wireless, or other connection.

One delivery mechanism, the direct point-to-point connection to a source of content, may comprise communication via an ordinary telephone line. This type of connection is typically initiated by the client to convey information to, or retrieve information from, a data server. Another delivery mechanism, the point-to-point connection through one or more networks, may comprise a typical connection between nodes on the Internet. Because data may be routed through many different shared networks in this case, it may be read, stored and written many times as it is transmitted from source **19** to client **12**. The third delivery mechanism may include a satellite, cable or terrestrial broadcast network.

Turning now to FIG. **2**, an overview of one embodiment of a broadcast station (head-end) **16** is shown. The broadcast station **16** of FIG. **2** includes an application server **250** and a database **230** which contains previously created interactive content. Also shown in FIG. **2** is a source **13** of content which is external to broadcast station **16** and coupled to broadcast station **16**. Database **230**, server **250**, and source **13** are coupled to a content processing mechanism **200** which is configured to process the content received and convey the processed content to a multiplexer **220**. Also coupled to multiplexer **220** is a source **240** of audio/video signals. One or more user profiles **330** may also be stored for use by content processing mechanism **200** and/or database **230**. In some embodiments, database **230** may actually store user profiles **330**, although they may also be stored separately as shown in this embodiment. User profiles **330** may include information for a particular user of the network, including personal and/or viewing preferences, credit card numbers, and other information. User profiles **330** will be discussed in greater detail below.

In one embodiment, content processing mechanism **200** may comprise a computer and may also be coupled to receive and convey content from the Internet or World Wide Web. Processing mechanism **200** is configured to convey the processed content to multiplexer **220**. Multiplexer **220** is also coupled to receive audio/video signals **240**. Multiplexer **220** multiplexes the received signals and conveys the multiplexed signal to network communications operator **17** where it is subsequently conveyed to a receiving device. Finally, broadcast station **16** includes a return data processor **210** coupled to back channel **26**. In one embodiment, return data processor **210** may comprise a modem which receives data for further processing within broadcast station **16**. While the above description describes a source of interactive content as being at a broadcast station **16**, this need not be the case. In an alternative embodiment, database **230**, and content processing mechanism **200** may reside elsewhere, such as at the location of a network communications operator **17**, or otherwise. An example of such an alternative embodiment may be a cable station which inserts interactive content into a broadcast signal prior to transmission.

Turning now to FIG. **3**, a block diagram of one embodiment of a communications network comprising a broadcast station, a set-top box, and a mobile unit is shown. Communications network **300** includes broadcast station **16**, set-top box **302**, and mobile unit **305**. Mobile unit **305** may be configured for wireless communications with both broadcast station **16** and set-top box **302**. Broadcast station **16** may be configured for communications with set-top box **302** through either wireless means or through hardwired means (e.g. cable).

Some embodiments may include fixed unit **308**. Fixed unit **308** may be a device such as a personal computer user's office or place of business. The fixed unit **308** may be configured to communicate with any of the other units in the system, either directly or indirectly. For example, fixed unit **308** may be configured to directly communicate with broadcast station **16** or set-top box **302** via an internet connection. Similarly, fixed unit **308** may be configured to communicate with mobile unit **305** indirectly, by first transmitting data to broadcast station **16** via an internet connection, wherein broadcast station **16** then relays the data to mobile unit **305** through a wireless link. In general, fixed unit **308** may communicate with other units of the communications network **300** depending on whether it is equipped for wireless communications, hard-wired communications, or both.

Mobile unit **305** may be one of several different devices configured for wireless communications. In one embodiment, mobile unit **305** may be a cellular telephone that is data enabled. A data enabled cellular telephone may be able to utilize services beyond that of normal phone services. In another embodiment, mobile unit **305** may be a personal digital assistant (PDA) or similar device. In still another embodiment, mobile unit **305** may be a mobile computer system that is configured for wireless communications. Other embodiments of mobile unit **305** are possible and contemplated, including embodiment designed specifically for use with the communications network described herein.

Mobile unit **305** may be used to enter and transmit information which may be used to create or update a user profile. Information entered through mobile unit **305** may be directly transmitted to broadcast station **16**, or may be transmitted to set-top box **302**. If the information is transmitted to set-top box **302**, the information may be stored and then forwarded to broadcast station **15**. In addition, mobile unit **305** may be configured to communicate directly with set-top box **302** via a wireless protocol.

In addition to other features, mobile unit **305** may include location detection technology, which may be used to pinpoint the precise location of the mobile unit, and hence its user. The location information may be combined with other information stored in the user profile in determining the timing and content of data transmissions to mobile unit **305**. In one embodiment, the location detection technology may comprise a global positioning system (GPS). In another embodiment, location detection technology may utilize techniques such as triangulation from multiple data transmitters.

Devices that may comprise mobile unit **305** may differ in their ability to present information. As such, user profiles may be used to ensure that only relevant information is present to the user of a particular mobile unit **305**. The information presented may be based both on user information and the type of device that comprises the user's embodiment of mobile unit **305**. For example, if mobile unit **305** is a portable computer system, data may be presented or formatted differently than it would if mobile unit **305** is a cellular telephone.

Broadcast station **16** may be similar to that illustrated in, FIG. **2**, or may be another embodiment. Broadcast station **16** is configured to communicate with both set-top box **302** and mobile unit **305**. In one embodiment, broadcast station **16** may communicate with set-top box through wireless means, such as a satellite link or other type of broadcast television link. In another embodiment, broadcast station **16** may communicate with set-top box **302** by hard-wired means, such as a cable television link.

Communications between broadcast station **16** and set-top box may encompass a wide variety of data exchanges. Broadcast station **16** may be configured to send television programming to set-top box **302**. Television programming may be broadcast by either analog or digital signals, and may include signals for high-definition television (HDTV). Communications between broadcast station **16** and set-top box **302** may also include internet communications. Broadcast station **16** may include connections to the internet, thereby allowing a user of set-top box **302** to send and receive e-mail, browse the world wide web, and perform other internet related activities. Broadcast station **16** may include database **230**. Database **230** may be used to store user profiles. Broadcast station **16** may receive data for use in generating the user profile from set-top box **302**, fixed unit **308**, or directly from mobile unit **305**. Broadcast station **16** may further be configured to access data from user profiles stored in database **230**. The data accessed from the user profile may be used to determine information that is to be sent to set-top box **302**, fixed unit **308**, and/or mobile unit **305**. Information transmitted by broadcast station **16** may be either "pushed" (information is sent without a user request) or "pulled" (information is sent based on a request by the user). Optionally, a profile **330**A may be stored in set-top box **302**, or in fixed unit **330**B. In general, user profile data may be stored anywhere within system **300**. Multiple, cached copies of user profile data may also be maintained within system **300**. Further, user profiles **330** or database **230** may also include device profiles for devices which may access the system in different modes. Such device profiles may include information describing particular details about devices which may be used to access the system **300**. One example of device profiling is the Wireless Application Protocol User Agent Profile Specification (WAP-248-UAPROF-20011020-a) which is concerned with capturing classes of device capabilities and preference information. These classes include the hardware and software characteristics of the device as well as information about the network to which the device is connected. The device profile contains information used for content formatting purposes. A device profile is distinct from a user profile that would contain application-specific information about the user for content selection purposes. These device profiles may then be used to select and format data which is suitable for presentation on the accessing device.

User profiles may include a wide variety of user information, and may include both user-entered information as well as usage history. User-entered information may include basic personal information (e.g. date of birth, etc.), credit card account information, memberships such as frequent flyer memberships, and various user preferences. Usage history information may be generated based on a user's activity on the network, including television viewing habits and preferences, locations browsed on the World Wide Web, and any other type of network access. User profiles may also be affected by the physical location and movements of a user who utilizes a device which can be tracked (i.e., a location trackable device). For example, if a user makes a phone call or other access from a location identified as a Mexican food restaurant, this fact may be noted in the user profile and used to indicate the user may like Mexican food. Alternatively, if a user frequently performs accesses from particular coffee/internet cafes, this fact may be noted in the user profile. Thus, user profiles may be created and updated based on user inputs and subsequent usage history on multiple devices and then shared by multiple devices. In some embodiments, user profiles may be automatically generated by a network operator. In other embodiments, the user profile may be created manually by the user. User profiles may also be created by a set-top box or other computing device.

In one embodiment, the user profiles are built by the broadcast service provider based upon the viewing data accumulated within the broadcast network. Such data may come, for example, from previous transactions. This data includes information on the various transactions which take place in the network, and may include transactions ranging from requests for pay-per-view events or subscription to broadcast provider or other third party provider services to interactive transactions to simple selections of programs. The specific data recorded in regard to the network transactions may vary from system to system. Transaction data may be recorded at the broadcast station. Data which is available to the broadcast station at the time of the transaction ("on-line" data) is collected at the broadcast station. Data which is not available to the broadcast station at the time of the transaction ("local" data) may be collected elsewhere, such as at the set-top box or the mobile unit. Local data is preferably stored in a non-volatile RAM of the set-top box so that it is not lost if the set-top box is powered down. The local data is accumulated in the set-top box until a predetermined amount of data has been collected or a predetermined time period (e.g., one month) has expired. The local data may then transmitted to the broadcast station. In some embodiments, the transmission of the local data to the broadcast station can be externally triggered by signals which are broadcast or individually transmitted to the set-top boxes. In other embodiments, the transmission of the local data to the broadcast station takes place when other real-time data, such as a purchase, needs to be transmitted to from the set-top box to the broadcast station.

The broadcast station may accumulate data on an entire population of subscribers to the broadcast network. This data forms the broadcast station's cumulative database. Based upon the information in the cumulative database, the broadcast service provider can determine viewing patterns, preferences and other information which form profiles corresponding to different types of viewers. These viewer population profiles may indicate that viewers of a particular program also tend to view a second program. Similarly, the profiles may indicate that viewers of a particular program may be interested in particular products and disinterested in others. For example, a viewer who watches an animated movie on a pay-per-view basis may be more interested in buying a videotape of cartoons than a videotape of an athletic event. Based upon the indications of the profiles, the broadcast service provider can make available to particular viewers the programs which they are most likely to watch or products and services which they are most likely to purchase. In this manner, the broadcast service provider can increase the effectiveness of marketing over the network by filtering or directing advertisements and programs to the viewers who are most likely to be impacted by them. The filtering of the program content of the broadcast program signal may be accomplished by generating a viewer preference filter. A viewer preference filter may be created according to a particular viewer's viewing habits, or personal preferences. Viewer preference filters may also be configured to take into account viewer population profiles and the relation of the viewer data to the profiles. Additionally, the viewer preference filter can be altered by the broadcast provider to promote particular services.

It should be noted that the "viewer preference filter" is used herein to describe data which is used, not simply to block certain content of a broadcast signal, but to provide a basis for customizing the content of the broadcast signal. The viewer preference filters can thus be considered individualized viewer preference profiles. The viewer preference filters can be used by applications which may block portions of the broadcast signal or portions of individual programs. For example, an application may block a commercial or a component of the commercial, such as a jingle. The viewer preference filters can also be used by applications which rearrange or add to the content of a broadcast signal. An example of such an application is one which changes the order in which channels are presented in an electronic programming guide. If the viewer is a sports fan, this application might present channels with basketball games before those having game shows. An application might also take some action apart from changing the content of the displayed programs. For instance, the application might selectively reject e-mail sent to the set-top box based on the viewer's profile (as contained in the viewer preference filter) and the likelihood that the viewer would not be interested in the e-mail. With the advent of local storage in the receiver, the filter can also be used to select the content that should be stored in the receiver for later use. Further, the filter may be used to select and present data which has previously been stored in the receiver.

The viewer preference filter may be implemented as a component of set-top box **302**, the filter may be implemented in a number of other ways, such as in a software application, and need not be a separate component of set-top box **302**. (It should also be noted that "transmitting filters" to the set-top box as used herein can mean both transmitting actual software filters and transmitting data which is used by hardware or software at the set-top box to implement filtering functions in a particular implementation.) The set-top box filters the remaining program content according using the viewer preference filter and displays or executes the filtered program signal components. The filtered broadcast program signal may then be passed on to a television. The television may be a standard television unit or a video monitor employing any suitable television format (e.g., NTSC or HDTV), or it may be replaced by other devices, such as a video recorder or another form of mass storage such as a magnetic hard disc or a writeable optical disc.

Information stored in the user profile may be combined with other information in order to determine data that is to be transmitted to mobile unit **305**. In one embodiment, information in the user profile may be combined with location information provided by location detection technology. For example, a GPS system in one embodiment of mobile unit **305** may detect that the mobile unit (and thus its user) are located near a Mexican restaurant. The user profile of the user of mobile unit **305** may include information indicating that the user has a preference for Mexican food. Responsive to receiving these two pieces of information, broadcast station **16** may transmit information to mobile unit **305** that may indicate to its user that he is near a Mexican restaurant.

In another example, a user of network **300** may be watching interactive television and may see an advertisement for a product he finds interesting. The user of network **300** may "tag" this advertisement using mobile unit **305**, thereby indicating interest in the product. This information may initially be sent from mobile unit **305** to set-top box **302**, and may then be forwarded to broadcast station **16**, where the information may be stored in the associated user profile. Broadcast station **16** may further respond by sending to mobile unit **305** information on where to purchase the advertised product. In addition, if mobile unit **305** includes location detection technology, it may be possible for broadcast station to transmit information on how to get to the location where the product is sold once the location of mobile unit **305** has been detected. If the user purchases the advertised product responsive to receiving information on where to purchase the product, the associated user profile **330** may be updated with usage history information.

In still another example, a user of network **300** may watch a cooking show on interactive television. The user may decide that they are interested in a recipe that is presented on the cooking show. The selection of the recipe, along with its ingredients and cooking instructions may then be stored in the associated user profile. Recipe information may be recalled on demand by the user of mobile unit **305**, thereby assisting the user in obtaining ingredients for the recipe, or in cooking the dish defined by the recipe.

Mobile unit **305** may also be used to program set-top box **302** to record programming (or a device coupled to set-top box **302**). Mobile unit **305** need not be in the proximity of set-top box **302** in order to perform the programming functions. A user of mobile unit **305** may enter data concerning the program to be recorded (i.e. program start time, channel, etc.). This data may be transmitted to broadcast station **16**, where it is then forwarded to set-top box **302**. Alternatively, data may be transmitted from mobile unit **305** directly to set-top box **302** in some embodiments.

Another possible use for network **300** is as a mechanism for electronic coupons. In one embodiment, broadcast station **16** may transmit an electronic coupon to mobile unit **305** based on information in the associated user profile. Subsequent to receiving the coupon via mobile unit **305**, the coupon may be redeemed at a store that honors such coupons. In one embodiment, mobile unit **305** may transmit the coupon to the cashier using a wireless technology (e.g. IR). Once transmitted, the coupon may be removed from mobile unit **305**. In one embodiment, a mobile unit may include technology to identify the location of the mobile unit (GPS, or other technology). When the mobile unit is detected by the system to be in the vicinity of a retailer which carries the product corresponding to the previously stored coupon, the system may automatically alert the user via the mobile unit. The user may then respond to the notification as desired.

The various selections made in the above examples may also result in the setting of bookmarks in set-top box **302**. In various embodiments, bookmarks may also be stored by broadcast station **16** or set-top box **302**. Furthermore, bookmarks may also be stored in fixed unit **308** for those embodiments having a fixed unit. Once the bookmarks are set, they may be removed from mobile unit **305**, which may have limited storage space. However, mobile unit **305** may still access these bookmarks at any time. The bookmarks may be accessed by interactions between mobile unit **305** and one of the other units (set-top box **302**, broadcast station **16**, or fixed unit **308**).

Turning now to FIG. **4**, one embodiment of a flow diagram illustrating the updating of a user profile based on actions taken with a mobile unit is shown. The embodiment shown illustrates one of many possible sequences that may involve user interaction with the TV system, as well as accessing and/or updating a user profile.

Method **800** begins with a user prompting the TV system in item **802**. The user may use the mobile unit **305** described above to access the TV system. In some cases accessing the TV system may involve the user having a mobile unit being in the general vicinity of a television set having a set-top box (e.g. the user is watching a television program on interactive TV). In another example, a user at a location remote to both the broadcast station and set-top box may prompt the TV system for information by manually inputting data into the mobile unit, which may then be transmitted to various places, such as the broadcast station or the set-top box via a wireless link. In yet another example, the mobile unit may automatically prompt the TV system without any manual input from the user based on detecting the location of the user, and hence the location of the mobile unit. Various means may be used for location detection, such as the use of a global positioning system or a triangulation system.

Following a prompt of the TV system, a user profile associated with a user of the mobile unit may be accessed (item **804**). As discussed above, the user profile may include information for a specific user of the TV system. The specific information may include basic personal information, credit card information, usage history, and viewer preference filters. This information may be combined with location information and other information (e.g. date/time of day) in order to select data which may be presented to the mobile unit (item **806**). In addition to the user profile and other information, the presentation of data may be dependent upon the type of unit making the access. The exact format of the data may be different for various types of mobile units, including cellular phones, PDA's, portable computers, and other types.

Based on the data presented to the mobile unit, the user may take certain actions (item **808**). The user's actions may be recorded by the mobile unit, and the mobile unit may also transmit information corresponding to these actions back to the TV system. This information may be recorded as usage history, and may also be used to update the user profile item **810**.

Countless examples may be presented of practical uses for this method. In one example, a user of the interactive TV system may be watching a commercial for a new product offering. The interactive television may prompt the user as to whether they are interested in the product. If the user indicates an interest, this information may be recorded and used to update the user profile. Alternatively, if the user indicates a negative interest, the user profile may be updated to prevent the interactive TV system from prompting the user again concerning this product. If the user expresses interest in the product, the user may at a later time request information on the location(s) of the restaurant(s) that offer this product. Furthermore, if it is detected that the user is operating the mobile unit in the vicinity of a retailer that offers the product, the TV system may then alert the user to this fact. The user may also record a purchase of the product, which may then be recorded as usage history in order to update the user profile.

Another example may relate to the use of the preference filters. In this example, a user watching interactive television may be presented with options to watch sports programming. Supposing the user has a preference for watching football games and other related programming over other types of sports, the user may typically choose to ignore other programming. Usage history incorporated into the user profile may then cause a preference filters to be updated such that the other (non-football) sports-related programs are not presented to the user. Subsequently, when accessing the system for sports scores via a mobile unit, the user is presented with football scores by default. In this manner, the user need not receive and traverse scores and information on items of no interest to the user. Furthermore, the user may manually set user preferences such that reminders of upcoming football related programming are sent to the mobile unit. Thus, a user who is in a remote location may receive a reminder of a football game or football related program that may be telecast at some point later in the day.

Turning now to FIG. **5**, one embodiment of a method **900** for interacting with a system as described above is illustrated. In the embodiment shown, a television viewer at home watches particular programs and may interact with applications. Based on the viewer's activity, a profile reflecting this activity is generated **904**. Alternatively, an existing user profile may be updated. The profile may include information gathered in either an "active" and/or "passive" manner. For example an "active" manner may include providing specific information in response to a request, such as a survey. Passively gathered information may include information based on a viewer's viewing habits. Many such techniques are possible and are contemplated.

Subsequent to the creation of the profile, the system detects a viewer/user access **906**. The nature of the access is then determined **908**. Upon determining the type of access, data is formatted to correspond to the type of access. For example, if the access is detected to be a remote access by a mobile unit, the data format is selected to correspond to the mobile unit **910**. The user profile corresponding to the accessing user is then accessed **912**. Based on the user profile, specific information may be selected for presentation to the user. The selected data is then formatted and conveyed to the mobile unit. Alternatively, if the user access is detected to be a non-remote access **908**, the selected format is chosen **914** to correspond to a television or other predetermined device. Utilizing the user profile, data is selected and conveyed to the user/viewer **916**. If the user/viewer interacts **918** with the presentation to the remote or non-remote device, the user profile may then be updated **920** in accordance with that interaction.

It is noted that the user profile may be created and/or updated based on accesses from any device within the system. Further, the user profile may be used to select information to presentation to any device within the system. In some cases, accessing the user profile of a user performing an access may require accessing the user profile at a remote location. For example, if a user profile is stored in a user's set-top box and the user performs an access using a wireless phone through a wireless phone network, communication through the phone network, television broadcast network, and/or the Internet may be required in order to access the user profile.

FIG. **6** shows one embodiment illustrating the relationship access, profiles, and data retrieval. Other embodiments are possible and are contemplated. The elements described in FIG. **6** may be located in one or more locations. In the embodiment shown, an access from a remote device is received at a port or other mechanism **602** configured to receive accesses. The received access may include a request for data **603** which is conveyed to device **605**. Device **605** may include any suitable hardware and/or software combination for servicing data requests. In the embodiment shown, device **605** includes user profile **604** and device profile **606**. In Alternative embodiments, user profile **604** and device profile **606** may be located apart from device **605**. In addition to including a request for data, the received access may also include an indication of the user making the request and the type of device being used to make the request. Device **605** may then utilize the user and device indications to select a corresponding user profile **604** and device profile **606**, respectively.

Based on the corresponding profiles and the data request, device **605** may then formulate a specific data retrieval request **607**. The device profile **606** may be used to select or format data which is suitable for the particular device. For example, if the device is text only, no graphic images will be conveyed in any response which is conveyed to the user device. Further, requested data which does not conform to the requirements of the device may be reformatted to a format which is suitable for the device. The user profile **604** may be used to select or format data in accordance with a profile or preferences of the accessing user. For example, in one embodiment the user profile **604** may be used to select an advertisement targeted to the particular user. Alternatively, the profile may indicate the user is a fan of a particular football team. Using this information, the device **605** may be configured to determine whether any news or scores concerning that team are available. This information may then be conveyed in conjunction with the requested data. Alternatively, an indication that this information is available may be conveyed to the user who may then decide whether they want the information conveyed to them. The user profile **604** may also include preferences indicating a specific presentation format the user has previously indicated. Numerous alternatives are possible and are contemplated.

Upon generating the data request, device **605** conveys the request **607** for retrieval of the data. In the embodiment shown, the request is conveyed via an optional port **608**. Data **610** may be located in one or more local and/or remote locations. Retrieved data **609** is then formatted **612** as appropriate for the device and the transmission medium and conveyed **614** to the requesting device. Hardware and/or software device **612** is configured to communicate **610**A-**610**B with other elements of the system as necessary to determine formatting requirements. In one embodiment, device **612** is coupled to advertisement injector **613** where advertisements targeted to the particular user may be obtained and included with the returned data. Accordingly, usage by a mobile or other remote unit may affect advertisements targeted to the user while watching television at home. Similarly, Web surfing activity may affect the data the user receives when making accesses using a wireless PDA. Ultimately, all user interaction with the system may affect the user profile which may in turn affect the information the user receives from any accessing device.

Various embodiments may further include receiving, sending or storing instructions and/or data implemented in accordance with the foregoing description upon a carrier medium. Generally speaking, a carrier medium may include transmission media or signals used in broadcast systems and otherwise such as electrical, electromagnetic, or digital signals, conveyed via a communication medium such as network and/or a wireless link. For example, a network operator may convey signals which describe program instructions via a broadcast system. Alternatively, conveyed signals may include one or more "triggers" which are configured to cause execution of program instructions. A carrier medium may also include storage media or memory media such as magnetic or optical media, e.g., disk, DVD or CD-ROM, volatile or non-volatile media such as RAM (e.g. SDRAM, RDRAM, SRAM, etc.), ROM, etc.

While the present invention has been described with reference to particular embodiments, it will be understood that the embodiments are illustrative and that the invention scope is not so limited. Any variations, modifications, additions, and improvements to the embodiments described are possible. These variations, modifications, additions, and improvements may fall within the scope of the inventions as detailed within the following claims.

What is claimed is:

1. A method for utilizing a user profile in an interactive television system, the method comprising:

updating a user profile responsive to a first user activity, the first user activity being initiated via a first device;

initiating a second user activity, the second user activity being initiated via a second device which is different from the first device, wherein either

(i) the first user activity is related to television viewing and the second user activity is unrelated to television viewing, or

(ii) the first user activity is unrelated to television viewing and the second user activity is related to television viewing;

accessing the user profile in response to the second user activity; and

transmitting data to a user responsive to the second user activity, wherein the transmitted data is based at least in part on the user profile, and wherein the first user activity affects a content of said data transmitted to the user responsive to the second user activity.

2. The method as recited in claim **1**, further comprising updating said user profile in response to said second user activity.

3. The method as recited in claim **2**, further comprising selecting non-requested data based on said user profile and transmitting said non-requested data.

4. The method as recited in claim **3**, wherein said non-requested data comprises an advertisement targeted to the user.

5. The method as recited in claim **1**, wherein said first user activity comprises an activity related to television viewing and the first device comprises a television receiver, and said second user activity is performed via a remote device that does not utilize the television receiver.

6. The method as recited in claim **5** wherein said first user activity is via a set-top box, said remote device is a wireless mobile unit, and wherein said set-top box and mobile unit are configured to communicate with one another.

7. The method as recited in claim **3**, further comprising detecting a physical location of the second device; and selecting the data to be transmitted at least in part on the physical location of the second device.

8. The method as recited in claim **5**, wherein the remote device is selected from the group consisting of: a cellular phone, a personal digital assistant, a fixed unit, and a portable computer system.

9. The method as recited in claim **1**, wherein said first user activity is performed via a remote device that does not utilize a television receiver, and said second user activity comprises an activity related to television viewing and the second device comprises a television receiver.

10. The method as recited in claim **1**, further comprising:

determining the type of said second device;

accessing a device profile corresponding to the second device;

formatting said data to correspond to said device profile prior to transmitting the data; and

transmitting the data to the second device.

11. The method as recited in claim **10**, further comprising storing the user profile at one or more of a television broadcast station, user set-top box, or other remote location configured to communicate within the system.

12. The method as recited in claim **1**, further comprising updating the user profile in response to detecting a physical location of a user's location trackable mobile unit.

13. The method as recited in claim **1**, wherein the user profile is based on data obtained in a passive manner, active manner, or both.

14. An interactive television system comprising:

a remote unit;

a set-top box; and

a broadcast station coupled to convey a programming signal to the set-top box;

wherein the system is configured to:

update a user profile responsive to a first user activity, the first user activity being initiated via a first device corresponding to one of the remote unit and the set-top box;

detect a second user activity, the second user activity being initiated via a second device corresponding to one of the remote unit and the set-top box, the second device being different from the first device, wherein either

(i) the first user activity comprises an activity related to television viewing and the second user activity comprises an activity unrelated to television viewing, or

(ii) the first user activity comprises an activity unrelated to television viewing and the second user activity comprises an activity related to television viewing;

access the user profile in response to the second user activity; and

transmit data responsive to the second user activity, wherein the transmitted data is based at least in part on the user profile, and wherein the first user activity affects a content of said data transmitted to the user responsive to the second user activity.

15. The system as recited in claim **14**, wherein the system is configured to update the user profile in response to the second user activity.

16. The system as recited in claim **15**, wherein the first device is the remote unit, said first user activity is via the remote unit and does not utilize the set-top box, and wherein the second device is the set-top box and the second user activity utilizes the set-top box.

17. The system as recited in claim **15**, wherein the system is further configured to:

determine the type of the second device;

access a device profile corresponding to the second device;

format the data to correspond to the device profile prior to transmitting the data; and

transmit the data to the second device.

18. The system as recited in claim **17**, wherein the user profile is stored at one or more of a television broadcast station, user set-top box, or other remote location configured to communicate within the television system.

19. The system as recited in claim **15**, wherein the system is further configured to select non-requested data based on said user profile and transmit said non-requested data to a user.

20. The system as recited in claim **14**, wherein the first device is the set-top box and the first user activity is performed via the set-top box, and wherein the second device is the remote unit and the second user activity is performed via the remote unit and does not utilize the set-top box.

21. The system as recited in claim **20** wherein said set-top box and remote unit are configured to communicate with one another.

22. The system as recited in claim **20**, wherein the system is further configured to detect a physical location of the second device; and select the data to be transmitted at least in part on the detected location.

23. The system as recited in claim **20**, wherein the remote device is selected from the group consisting of: a cellular phone, a personal digital assistant, a fixed unit, and a portable computer system.

24. The system as recited in claim **14**, wherein the system is further configured to update the user profile in response to detecting a physical location of a user's location trackable mobile unit.

25. The system as recited in claim **14**, wherein the user profile is based on data obtained in a passive manner, active manner, or both.

26. A computer readable storage medium comprising program instructions, or triggers to launch execution of program instructions, wherein the program instructions are executable by a computing device to:

update a user profile responsive to a first activity, the first user activity being initiated via a first device;

detect a second user activity, the second user activity being initiated via a second device which is different from the first device, wherein either

(i) the first user activity comprises an activity related to television viewing and the second user activity comprises an activity unrelated to television viewing, or

(ii) the first user activity comprises an activity unrelated to television viewing and the second user activity comprises an activity related to television viewing;

access the user profile in response to the second user activity; and

transmit data responsive to the second user activity, wherein the transmitted data is based at least in part on the user profile, and wherein the first user activity affects a content of said data transmitted to the user responsive to the second user activity.

27. The computer readable storage medium as recited in claim **26**, wherein the first user activity is performed via a set-top box, and the second user activity is performed via the remote unit and does not utilize the set-top box.

28. The carrier medium as recited in claim **27**, wherein the remote unit is selected from the group consisting of: a cellular phone, a personal digital assistant, a fixed unit, and a portable computer system.

29. The computer readable storage medium as recited in claim **26**, wherein the program instructions are further executable to:

determine the type of the second device;

access a device profile corresponding to the second device;

format the data to correspond to the device profile prior to transmitting the data; and

transmit the data to the second device.

30. The computer readable storage medium as recited in claim **26**, wherein the program instructions are executable to select non-requested data based on said user profile and transmit said non-requested data to a user.

31. The computer readable storage medium as recited in claim **26**, wherein the program instructions are executable to select the data to be transmitted at least in part on the detected physical location of the second device.

32. The carrier medium as recited in claim **26**, wherein the user profile is based on data obtained in a passive manner, active manner, or both.

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/s/ Erika H. Arner

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